

FIG. 1

2/87

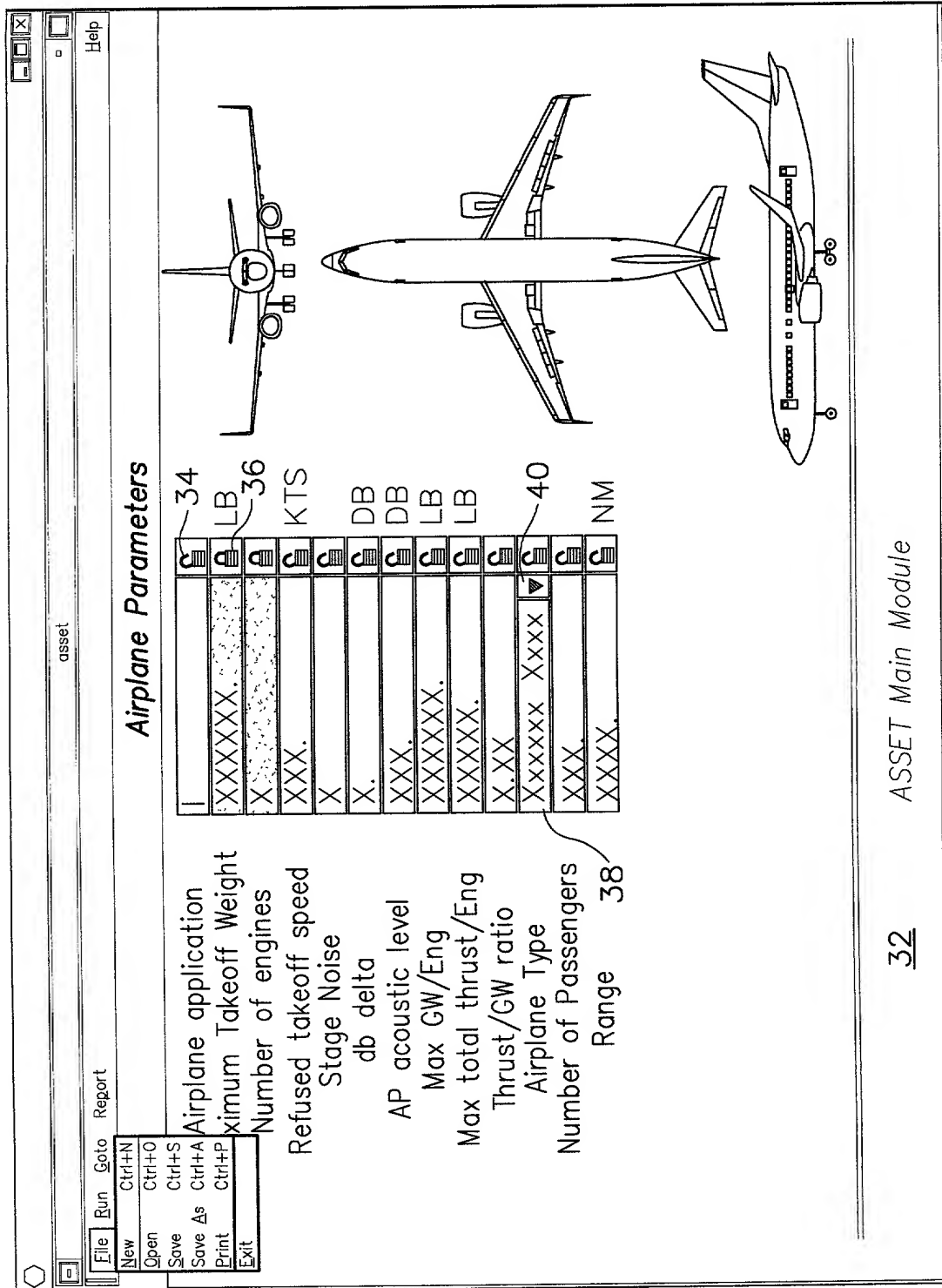


FIG. 2

3/87

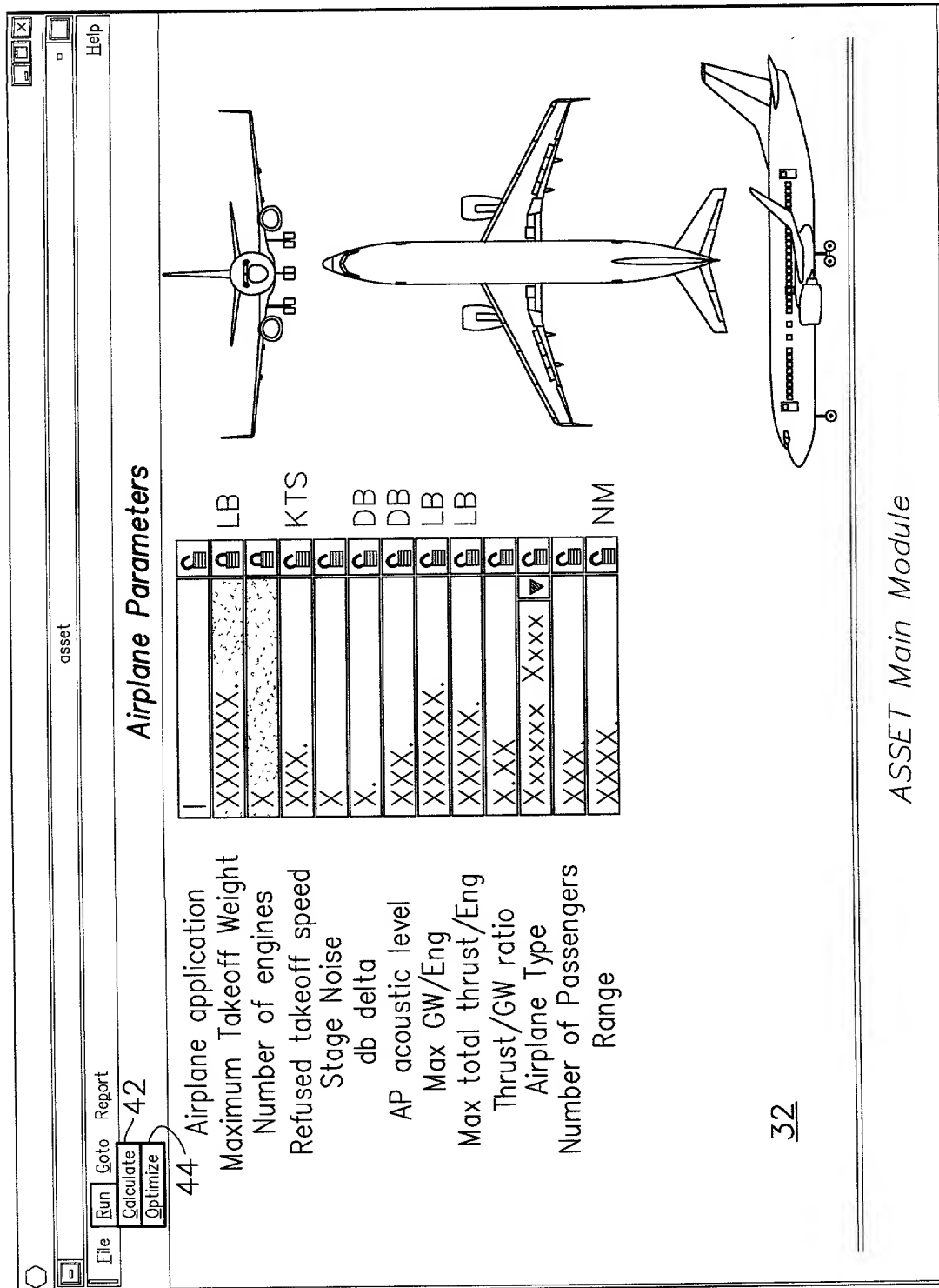


FIG. 3

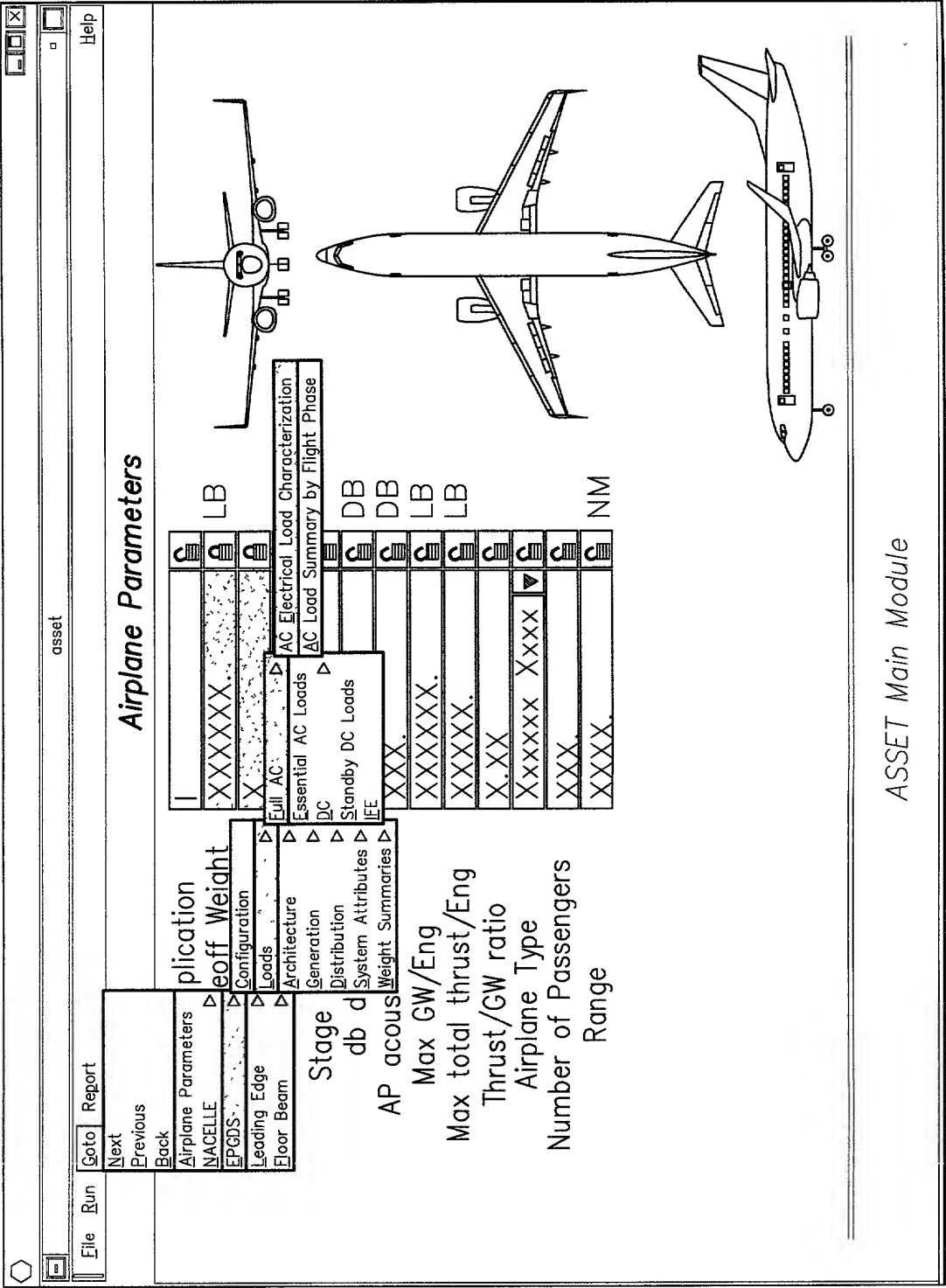


FIG. 4

FileRunGotoReport

asset

Help

Configuration

General:

48a

50

48

<input checked="" type="checkbox"/>	TRUE	
<input type="checkbox"/>	XXXXXX	
<input type="checkbox"/>	FALSE	
<input type="checkbox"/>	FALSE	
<input checked="" type="checkbox"/>	TRUE	
<input type="checkbox"/>	XXXXXX	
<input type="checkbox"/>	XXX.XX	
<input type="checkbox"/>	XX.XX	
<input type="checkbox"/>	X	
<input type="checkbox"/>	X	
<input type="checkbox"/>	XX.XX	
<input type="checkbox"/>	XX.XX	
<input type="checkbox"/>	XXXX.XX	
<input type="checkbox"/>	XXX.XX	

Fly-by-Wire

Frequency Type

Dual EE Bay

Double Voltage

RAT Generator?

Technology Era

Fuselage Length

Fuselage Diameter

Number of Passenger Entry/Exit Doors

Number of External Power Panels

Fan Diameter

Sweep Angle

Wing Span

Horizontal Tail Span

FT

FT

IN

DEG

IN

IN

ASSET EPGDS Method

FIG. 5A

6/87

File Run Goto Report

asset

Help

---

### Configuration

Body CL to O/B Engine CL

Side-of-Body to I/B Engine CL

Side-of-Body to O/B Engine CL

Dist. along LE I/B Eng. to Side-of-Body

Dist. along LE O/B Eng. to Side-of-Body

Dist. from Fwd.E/E Bay to Front Spar BS

Dist from I/B Eng. to EE Bay

Dist from O/B Eng. to EE Bay

Length of Main EE Bay

H - Lower Lobe Height

W1 Cabin Width

W2 Cargo Floor Width

Main E/E Bay Volume

Strut location

Accessory location

X.XX	IN
XXX.XX	IN
X.XX	IN
XXX.XX	IN
X.XX	IN
X.XX	IN
XXX.XX	IN
X.XX	IN
XX.XX	IN
XX.XX	IN
XXX.XX	IN
XXX.XX	IN
XXX.XX	IN
XXX.XX	FT^3
XXX	
XXX	

---

ASSET EPGDS Method

FIG. 5B

7/87

AC Electrical Load Characterization	
Number of Fans	X.X
Recirculation Fans	X.X
Number of E/E Cooling Vent Fans	X.X
Number of E/E Cooling Supply Fans	X.X
Number of TRUs	X.X
Number of ACMPs	X.X
Number of Window/Windshield Heaters	X.X
Number of Lavatories	X.X
52	
Number of Wide Body Pumps	X.X
Number of Wide Body Boost Pumps	X.X
Number of Wide Body Override Pumps	X.X
Number of Wide Body Jettison Pumps	X.X
Number of Narrow Body Pumps	X.X
Number of Narrow Body Boost Pumps	X.X
Number of Narrow Body Override Pumps	X.X
Number of Narrow Body Jettison Pumps	X.X

FIG. 6

ASSET EPGDS Method

8/87

AC Load Summary by Flight Phase						
ATA Subsystems	---Passenger Loading---		---Engine Start---		---Taxi Out---	
	(kVA)	(PF)	(kVA)	(PF)	(kVA)	(PF)
21 Air Conditioning	◇ XXX.XX	▢	◇ XX.XX	▢	◇ XX.XX	▢
22 Auto Flight	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢
23 Communications	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢
24 Electrical Power	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢
25 Equipment/Furnishings	◇ XX.XX	▢	◇ XX.XX	▢	◇ XX.XX	▢
26 Fire Protection	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢
27 Flight Control	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢
28 Fuel	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢
29 Hydraulic Power System	◇ XX.XX	▢	◇ XX.XX	▢	◇ XX.XX	▢
30 Ice/Rain Protection	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢
31 Instruments	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢
32 Landing Gear	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢
Maximum Flight Phase Load ◇ XXX.XX ▢ KVA ◇ X.XX ▢ PF						
ASSET EPGDS Method					54	

FIG. 7A



9/87

AC Load Summary by Flight Phase										
ATA Subsystems	---Passenger Loading---			---Engine Start---			---Taxi Out---			
	(kVA)	(PF)	(kVA)	(PF)	(kVA)	(PF)	(kVA)	(PF)		
32 Landing Gear	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢
33 Lights	◇ XX.XX	▢	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢
34 Navigation	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢
35 Oxygen	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢
36 Pneumatics	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢
38 Water/Waste	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢
46 Electronic Library	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢
48 Airplane Auxiliary Power	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢
52 Doors	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢
57 Folding Wing	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢
73 Engine Fuel Control	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢
74 Ignition	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢	◇ X.XX	▢
Maximum Flight Phase Load ◇ XXX.XX ▢ KVA ◇ X.XX ▢ PF										
ASSET EPGDS Method										

FIG. 7B

File Run Goto Report		asset		Help			
AC Load Summary by Flight Phase							
		--Take-off & Climb--		---Cruise---		--Descent & Land--	
ATA Subsystems		(kVA)	(PF)	(kVA)	(PF)	(kVA)	(PF)
32 Landing Gear		◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢
33 Lights		◇ XX.XX ▢	◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢	◇ XX.XX ▢	◇ X.XX ▢
34 Navigation		◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢
35 Oxygen		◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢
36 Pneumatics		◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢
38 Water/Waste		◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢
46 Electronic Library		◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢
49 Airplane Auxiliary Power		◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢
52 Doors		◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢
57 Folding Wing		◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢
73 Engine Fuel Control		◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢
74 ignition		◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢	◇ X.XX ▢
Maximum Flight Phase Load		◇ XXX.XX ▢	◇ KVA	◇ X.XX ▢	◇ PF		
						ASSET EPGDS Method	

FIG. 7C

206010 22500660

INVENTOR: BOND, et al.

SN: 09/900,522; FILED 7/6/01

ATTY: MARK D. ELCHUK; PHONE: (248) 641-1229

11/87

AC Load Summary by Flight Phase									
ATA Subsystems	-- Take-off & Climb --		--- Cruise ---		-- Descent & Land --				
	(kVA)	(PF)	(kVA)	(PF)	(kVA)	(PF)			
73 Engine Fuel Control	< XXX.XX	> 1.00	< XXX.XX	> 1.00	< XXX.XX	> 1.00	< XXX.XX	> 1.00	< XXX.XX
74 Ignition	< XXX.XX	> 1.00	< XXX.XX	> 1.00	< XXX.XX	> 1.00	< XXX.XX	> 1.00	< XXX.XX
75 Air	< XXX.XX	> 1.00	< XXX.XX	> 1.00	< XXX.XX	> 1.00	< XXX.XX	> 1.00	< XXX.XX
76 Engine Controls	< XXX.XX	> 1.00	< XXX.XX	> 1.00	< XXX.XX	> 1.00	< XXX.XX	> 1.00	< XXX.XX
77 Engine Indicating	< XXX.XX	> 1.00	< XXX.XX	> 1.00	< XXX.XX	> 1.00	< XXX.XX	> 1.00	< XXX.XX
78 Exhaust	< XXX.XX	> 1.00	< XXX.XX	> 1.00	< XXX.XX	> 1.00	< XXX.XX	> 1.00	< XXX.XX
79 Oil	< XXX.XX	> 1.00	< XXX.XX	> 1.00	< XXX.XX	> 1.00	< XXX.XX	> 1.00	< XXX.XX
80 Starting	< XXX.XX	> 1.00	< XXX.XX	> 1.00	< XXX.XX	> 1.00	< XXX.XX	> 1.00	< XXX.XX
Flight Phase Subtotals	< XXX.XX	> 1.00	< XXX.XX	> 1.00	< XXX.XX	> 1.00	< XXX.XX	> 1.00	< XXX.XX
Error/Growth Factor( 15%)	< XXX.XX	> 1.00	< XXX.XX	> 1.00	< XXX.XX	> 1.00	< XXX.XX	> 1.00	< XXX.XX
Flight Phase Totals	< XXX.XX	> 1.00	< XXX.XX	> 1.00	< XXX.XX	> 1.00	< XXX.XX	> 1.00	< XXX.XX
Maximum Flight Phase Load < XXX.XX KVA < X.XX PF									
ASSET EPGDS Method									

FIG. 7D

206010" 22500660

INVENTOR: BOND, et al.

SN: 09/900,522; FILED 7/6/01

ATTY: MARK D. ELCHUK; PHONE: (248) 641-1229

12/87

Essential AC Loads				
	Quantity	Load per Unit	Totals	
Number of Upper Recirculating Fans	X.X	@<>	X.XX	Total Fan Load XX.XX KVA
Number of Lower Recirculating Fans	X.X	@<>	X.XX	
Number of E/E Cooling Supply Fans	X.X	@<>	X.XX	
Number of E/E Cooling Vent Fans	X.X	@<>	X.XX	
Number of Hydraulic ACMP Pumps	X.X	@<>	X.XX	Total Pump Load XX.XX KVA
Number of Fuel Boost Pumps	X.X	@<>	X.XX	
Number of Fuel Override Pumps	X.X	@<>	X.XX	
Baseline Flight & Electronic, Ice & Rain				Passenger Load X.XX KVA
Baseline Flight & Electronic, Electronics	X.XX			Baseline Flight & Electronics Total Load XX.XX KVA
	X.XX			
				Subtotal of Essential Loads XX.XX KVA
				General Feeder Loss X.XX KVA
				Total of Essential Loads XX.XX KVA

File Run Goto Report

asset

Help

58 ASSET EPGDS Method

FIG. 8

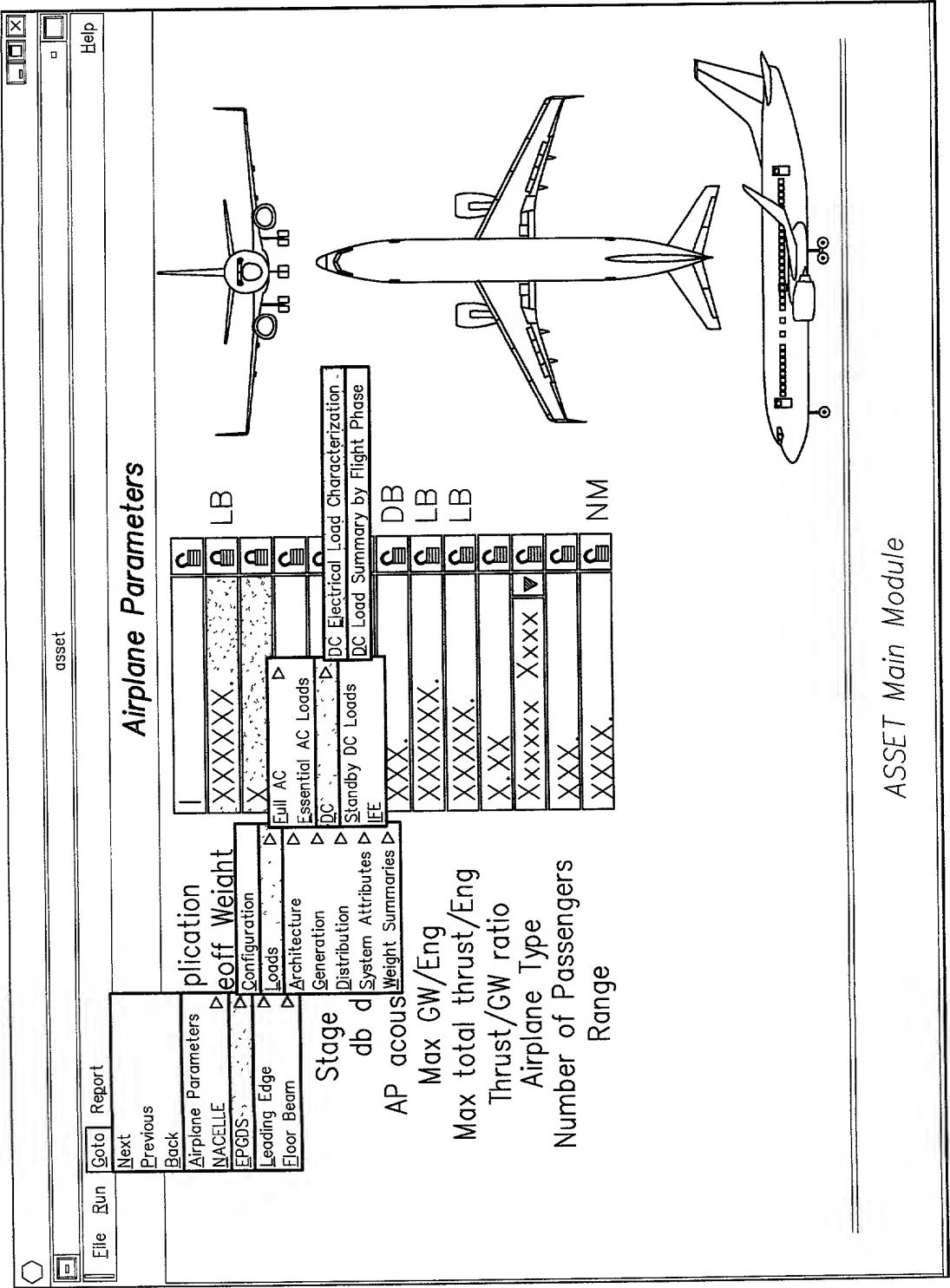


FIG. 9

INVENTOR: BOND, et al.

SN: 09/900,522; FILED 7/6/01

ATTY: MARK D. ELCHUK; PHONE: (248) 641-1229

14/87

FileRunGotoReport

asset

Help

DC Electrical Load Characterization

Number of Main Landing Gear Wheels	X.X	
Number of APU Generators	X.X	
Number of Doors	X.X	
Number of Tanks	X.X	

ASSET EPGDS Method

FIG. 10



206010" 23500550

TITLE: AIRCRAFT SYNTHESIS AND SYSTEMS EVALUATION METHOD FOR DETERMINING AND  
EVALUATING ELECTRICAL POWER GENERATION AND DISTRIBUTION SYSTEM COMPONENTS

INVENTOR: BOND, et al.

SN: 09/900,522; FILED 7/6/01

ATTY: MARK D. ELCHUK; PHONE: (248) 641-1229

16/87

DC Load Summary by Flight Phase						
ATA Subsystems	Pass Loading (Amps)	Engine Start (Amps)	Taxi-Out (Amps)	Take-off & Climb (Amps)	Cruise (Amps)	Descent & Land (Amps)
31 Instruments	◇ XX.XX	◇ XX.XX	◇ XX.XX	◇ XX.XX	◇ XX.XX	◇ XX.XX
32 Landing Gear	◇ X.XX	◇ X.XX	◇ X.XX	◇ X.XX	◇ X.XX	◇ X.XX
33 Lights	◇ XX.XX	◇ XX.XX	◇ XX.XX	◇ XX.XX	◇ XX.XX	◇ XX.XX
34 Navigation	◇ X.XX	◇ X.XX	◇ X.XX	◇ X.XX	◇ X.XX	◇ X.XX
35 Oxygen	◇ X.XX	◇ X.XX	◇ X.XX	◇ X.XX	◇ X.XX	◇ X.XX
36 Pneumatics	◇ X.XX	◇ X.XX	◇ X.XX	◇ X.XX	◇ X.XX	◇ X.XX
38 Water/Waste	◇ X.XX	◇ X.XX	◇ X.XX	◇ X.XX	◇ X.XX	◇ X.XX
46 Electronic Library	◇ X.XX	◇ X.XX	◇ X.XX	◇ X.XX	◇ X.XX	◇ X.XX
49 Airplane Auxiliary Power	◇ X.XX	◇ X.XX	◇ X.XX	◇ X.XX	◇ X.XX	◇ X.XX
52 Doors	◇ X.XX	◇ X.XX	◇ X.XX	◇ X.XX	◇ X.XX	◇ X.XX
57 Folding Wing	◇ X.XX	◇ X.XX	◇ X.XX	◇ X.XX	◇ X.XX	◇ X.XX
Maximum Flight Phase Direct Current Load						XXX.XX AMPS
ASSET EPGDS Method						

FIG. 11B



DC Load Summary by Flight Phase						
ATA Subsystems	Pass Loading (Amps)	Engine Start (Amps)	Taxi-Out (Amps)	Take-off & Climb (Amps)	Cruise (Amps)	Descent & Land (Amps)
52 Doors	◇ X.XX █	◇ X.XX █	◇ X.XX █	◇ X.XX █	◇ X.XX █	◇ X.XX █
57 Folding Wing	◇ X.XX █	◇ X.XX █	◇ X.XX █	◇ X.XX █	◇ X.XX █	◇ X.XX █
73 Engine Fuel Control	◇ X.XX █	◇ X.XX █	◇ X.XX █	◇ X.XX █	◇ X.XX █	◇ X.XX █
74 Ignition	◇ X.XX █	◇ X.XX █	◇ X.XX █	◇ X.XX █	◇ X.XX █	◇ X.XX █
75 Air	◇ X.XX █	◇ X.XX █	◇ X.XX █	◇ X.XX █	◇ X.XX █	◇ X.XX █
76 Engine Controls	◇ X.XX █	◇ X.XX █	◇ X.XX █	◇ X.XX █	◇ X.XX █	◇ X.XX █
77 Engine Indicating	◇ X.XX █	◇ X.XX █	◇ X.XX █	◇ X.XX █	◇ X.XX █	◇ X.XX █
78 Exhaust	◇ X.XX █	◇ X.XX █	◇ X.XX █	◇ X.XX █	◇ X.XX █	◇ X.XX █
79 Oil	◇ X.XX █	◇ X.XX █	◇ X.XX █	◇ X.XX █	◇ X.XX █	◇ X.XX █
80 Starting	◇ X.XX █	◇ X.XX █	◇ X.XX █	◇ X.XX █	◇ X.XX █	◇ X.XX █
Flight Phase Totals	◇ XXX.XX █	◇ XXX.XX █	◇ XXX.XX █	◇ XXX.XX █	◇ XXX.XX █	◇ XXX.XX █
Maximum Flight Phase Direct Current Load				XXX.XX █ AMPS		
ASSET EPGDS Method						

FIG. 11C

INVENTOR: BOND, et al.

SN: 09/900,522; FILED 7/6/01

ATTY: MARK D. ELCHUK; PHONE: (248) 641-1229

18/87

206070 24500650

File Run Goto Report


asset

Help

Standby DC Loads

Emergency/Standby Loads

XX.XX

 AMPS

60

ASSET EPGDS Method

FIG. 12

INVENTOR: BOND, et al.

SN: 09/900,522; FILED 7/6/01

ATTY: MARK D. ELCHUK; PHONE: (248) 641-1229

19/87

206070" 22500550

File

Run

Goto

Report

asset

Help

IFE

Technology Era Constant

System Factor

Airflow Constant

Fan performance coefficient

IFE Power Factor

IFE Utilization Factor

IFE Load

X.XXX

X.XXX

XXX.X

X.XXXXXXXX

X.XX

XXX.X

X.X

CFM/KVA

KVA/CFM

KVA

62

ASSET EPGDS Method

FIG. 13

206010 22500560

20/87

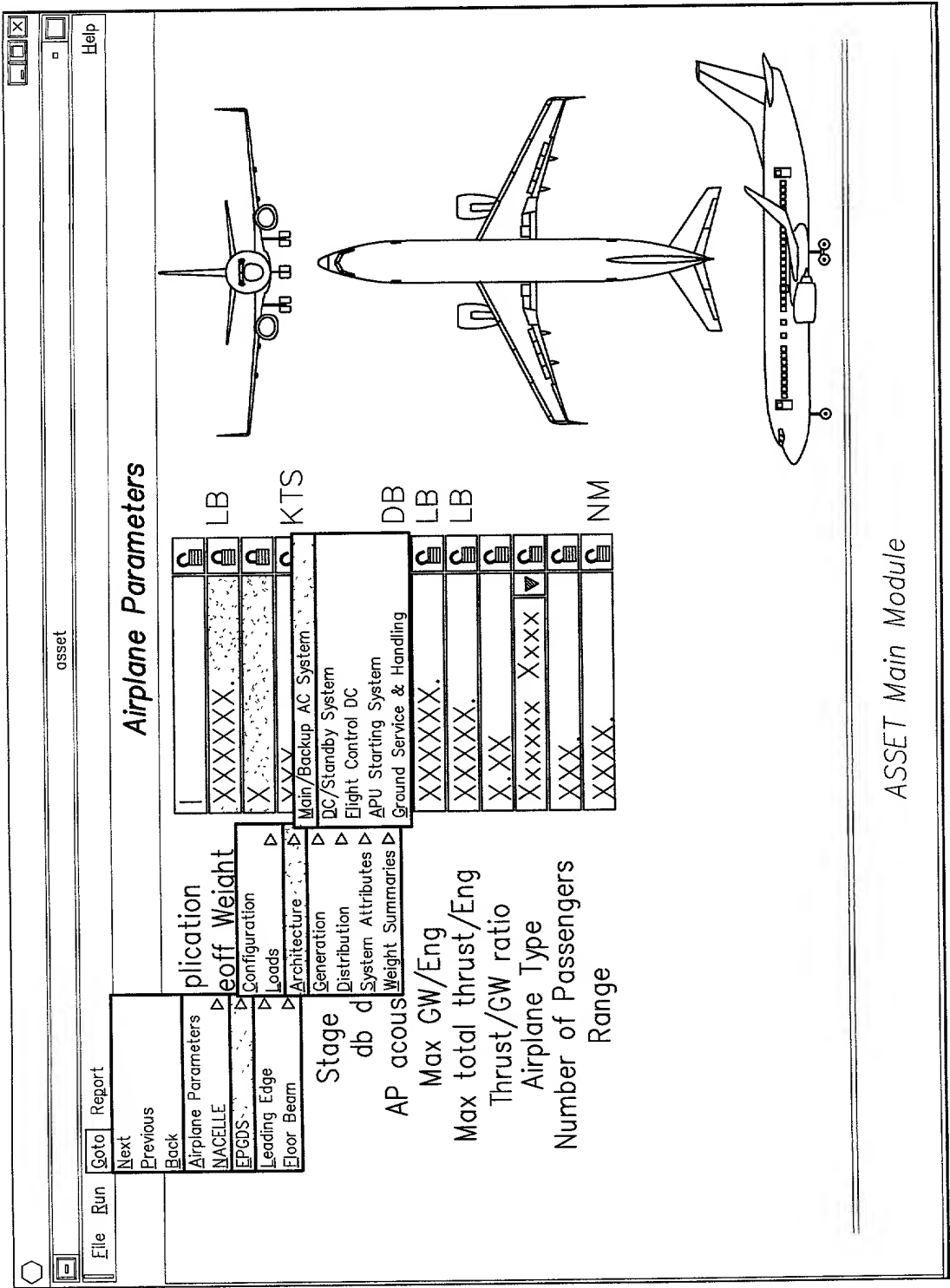


FIG. 14

206010-22500650

21/87

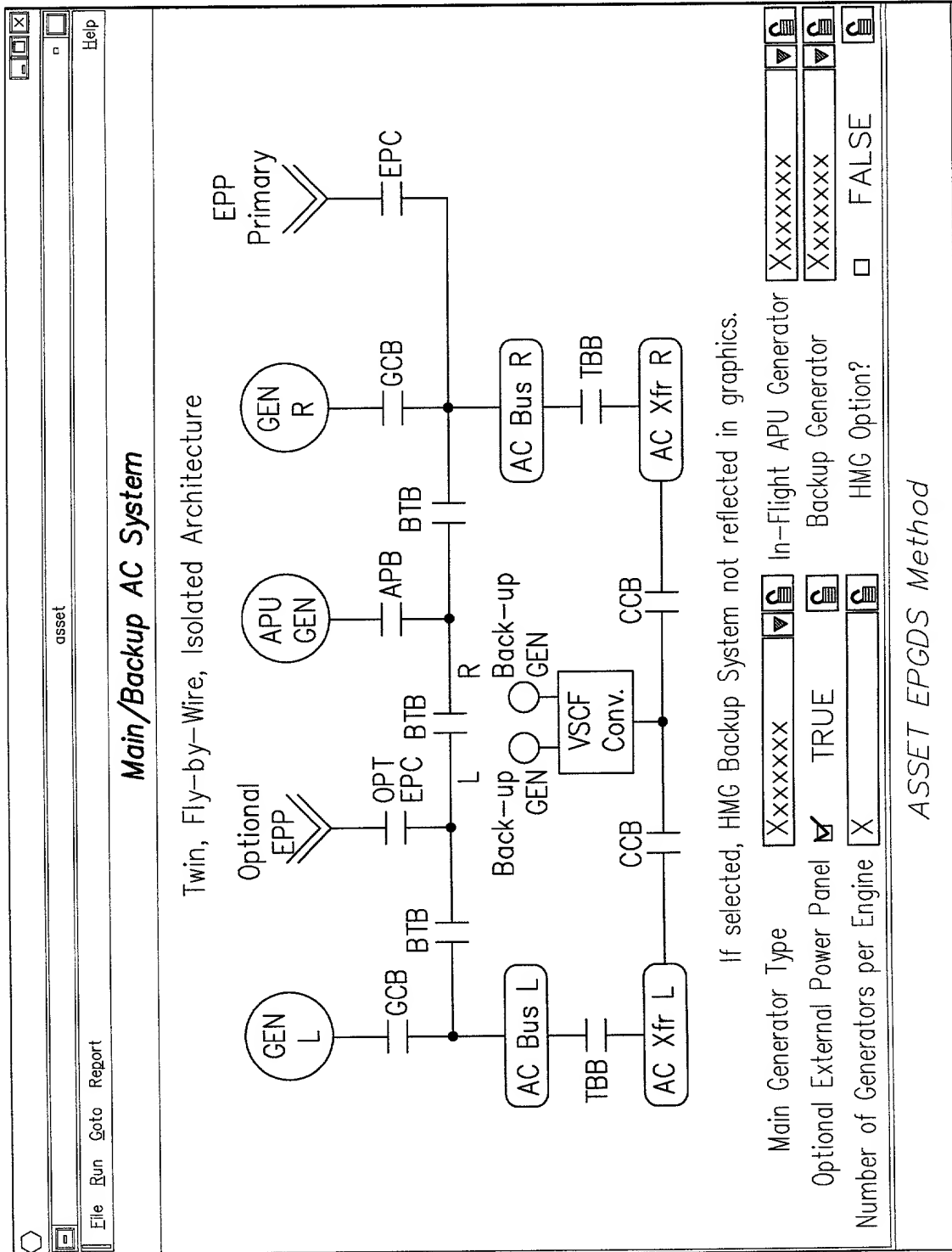
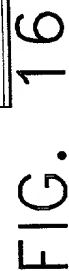


FIG. 15



23/87

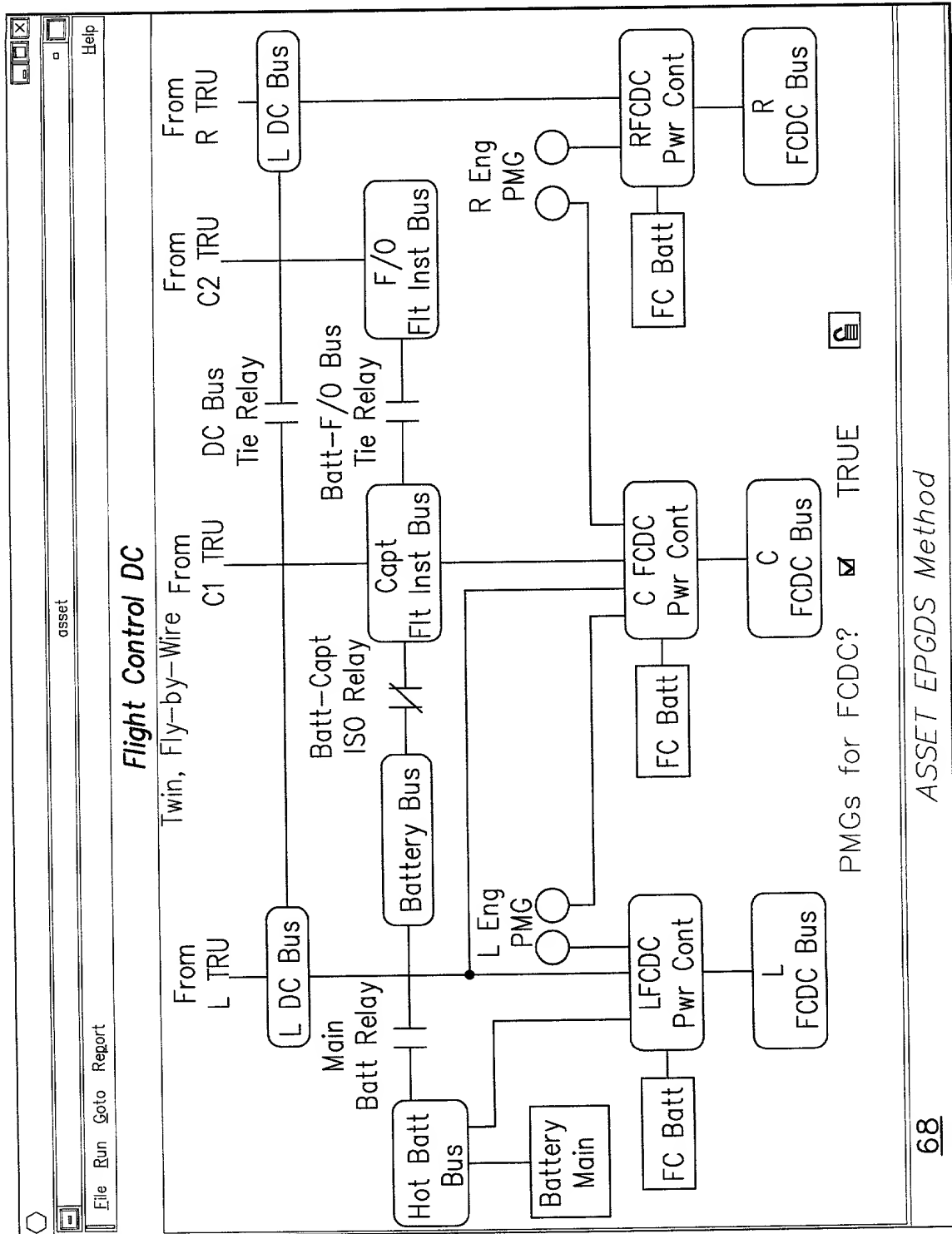


FIG. 17

24/87

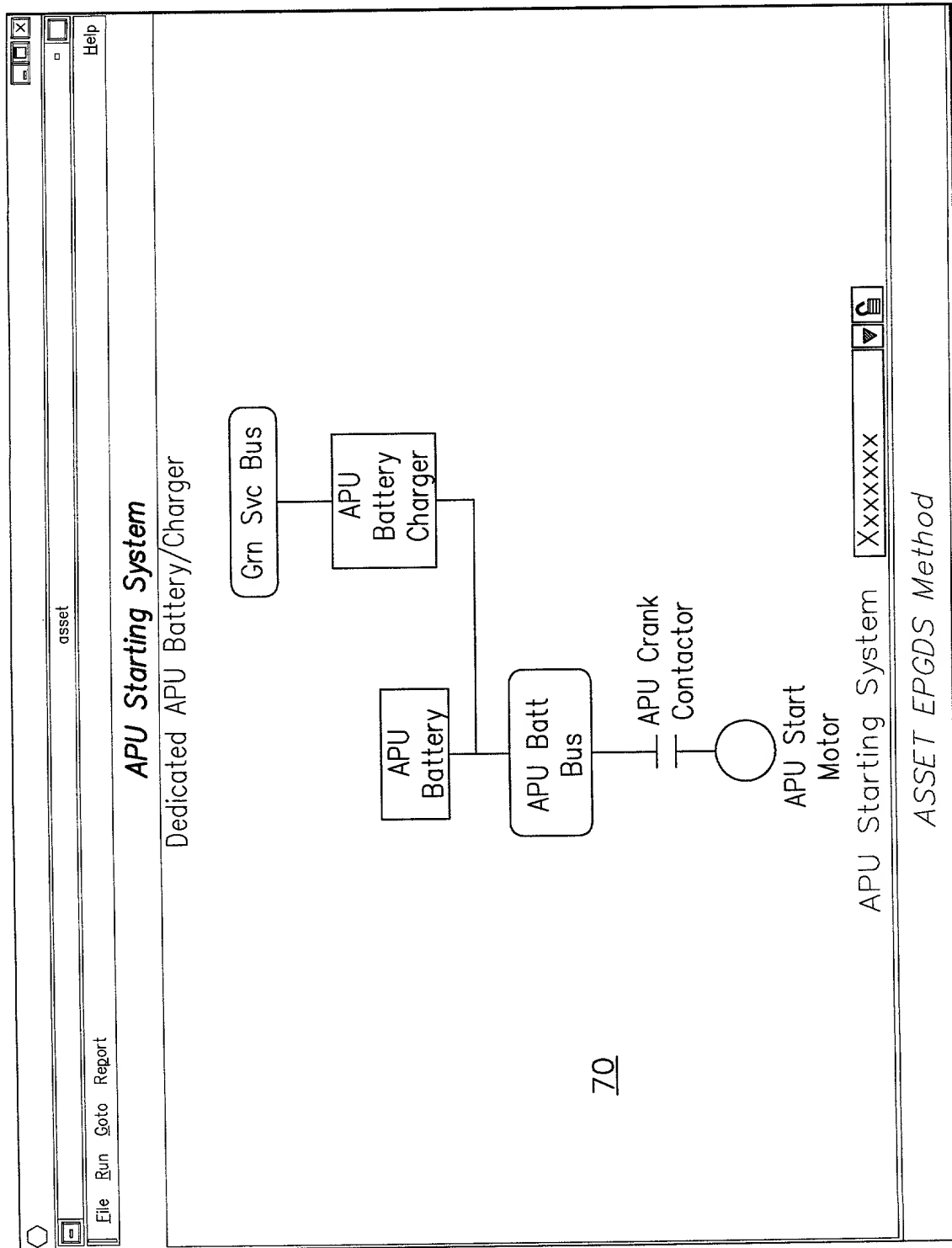


FIG. 18



25/87

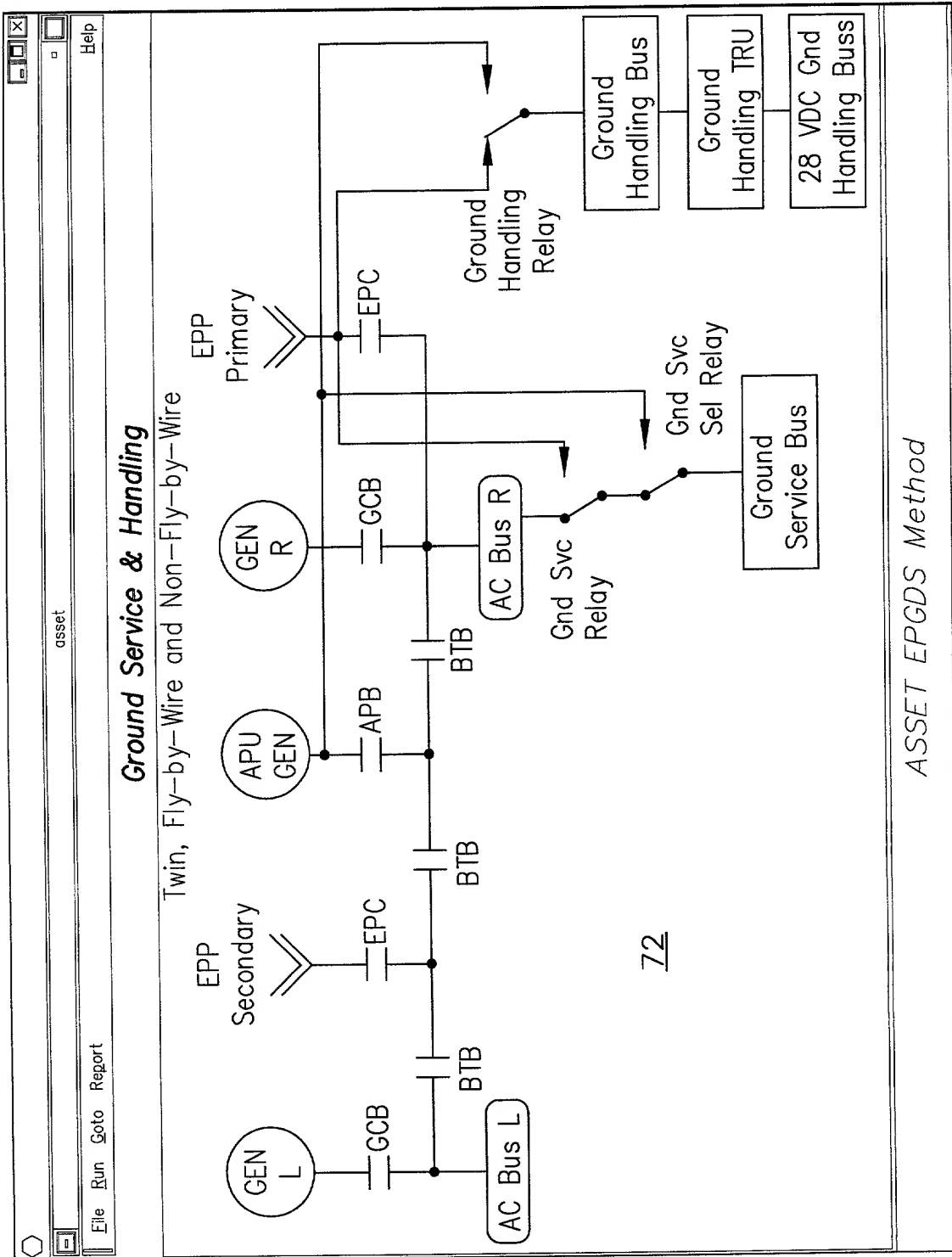


FIG. 19

INVENTOR: BOND, et al.

SN: 09/900,522; FILED 7/6/01

ATTY: MARK D. ELCHUK; PHONE: (248) 641-1229

26/87

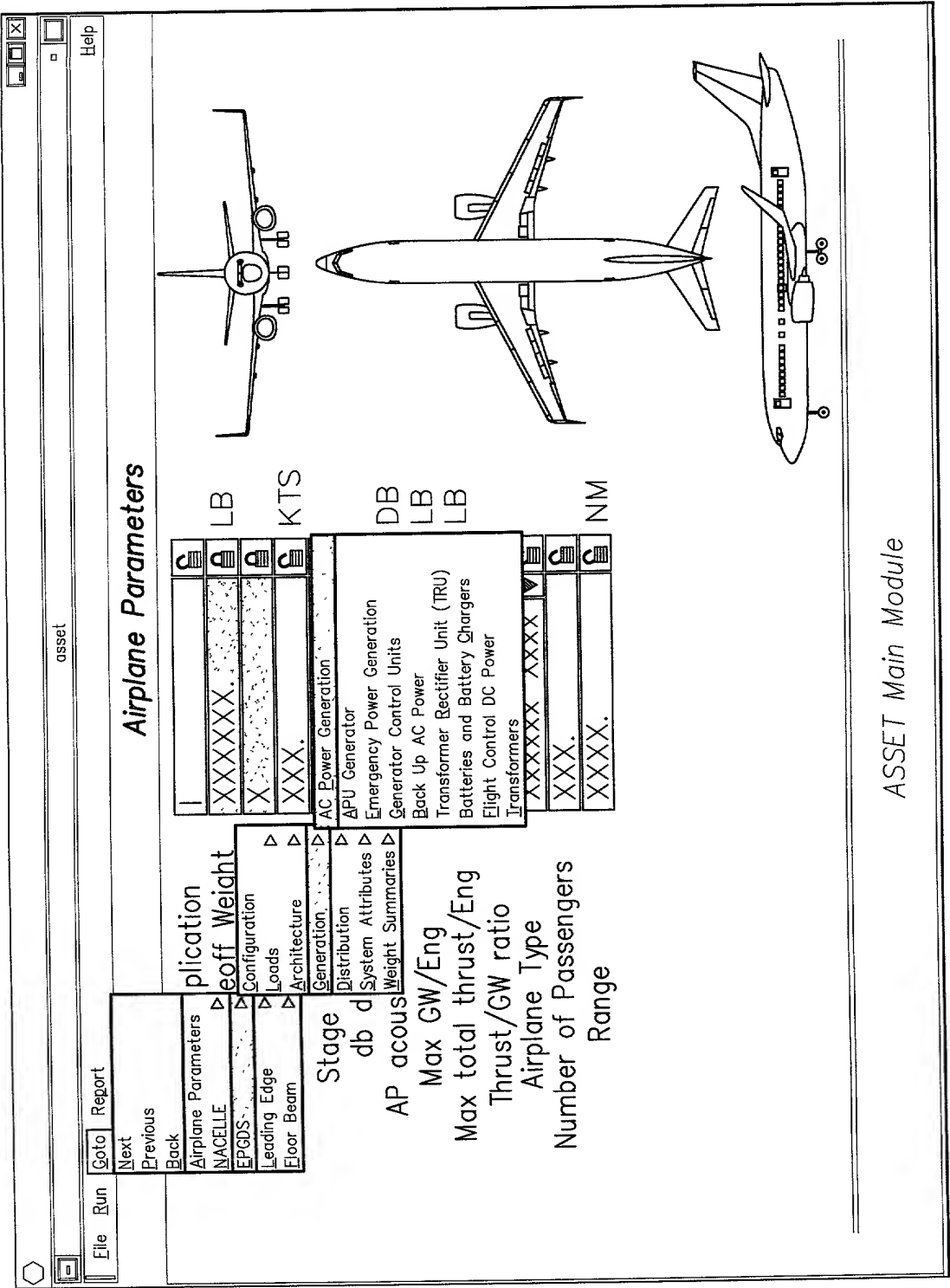


FIG. 20

27/87

FileRunGotoReport

asset

Help

AC Power Generation

Generator Input SpeedXXXXX.RPM

Method of CoolingXxxxxx

Generator CapacityXX.XKVA

Main AC Power Generator WeightXXX.XLB

VSCF Converter Config.Xxxxxx

Maximum Converter LoadX.XKVA

Main Converter Unit WeightX.XLB

IDG

ATA	Chapter	Section Title	Motor Controller Load KVA	Motor Controller Weight LB
<			<X.X	<X.X
<			<X.X	<X.X
<			<X.X	<X.X
<			<X.X	<X.X
<			<X.X	<X.X
<			<X.X	<X.X

IDG HydraulicsXxxxxx

Total Motor Controller WeightXX.XLB

74

ASSET EPGDS Method

FIG. 21

INVENTOR: BOND, et al.

SN: 09/900,522; FILED 7/6/01

ATTY: MARK D. ELCHUK; PHONE: (248) 641-1229

28/87

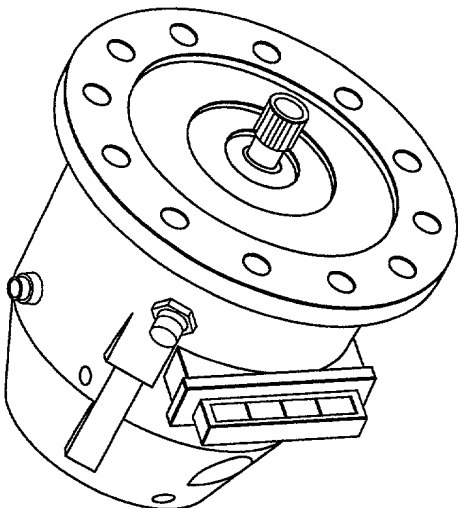
206010" 22500660

File Run Goto Report

asset

Help

APU Generator



☒ In-Flight Operable APU

☐ APU Generator Capacity

☐ APU Generator Weight

☐ Number of APU Generators

TRUE

XX.X

XX.X

X.X

☐ KVA

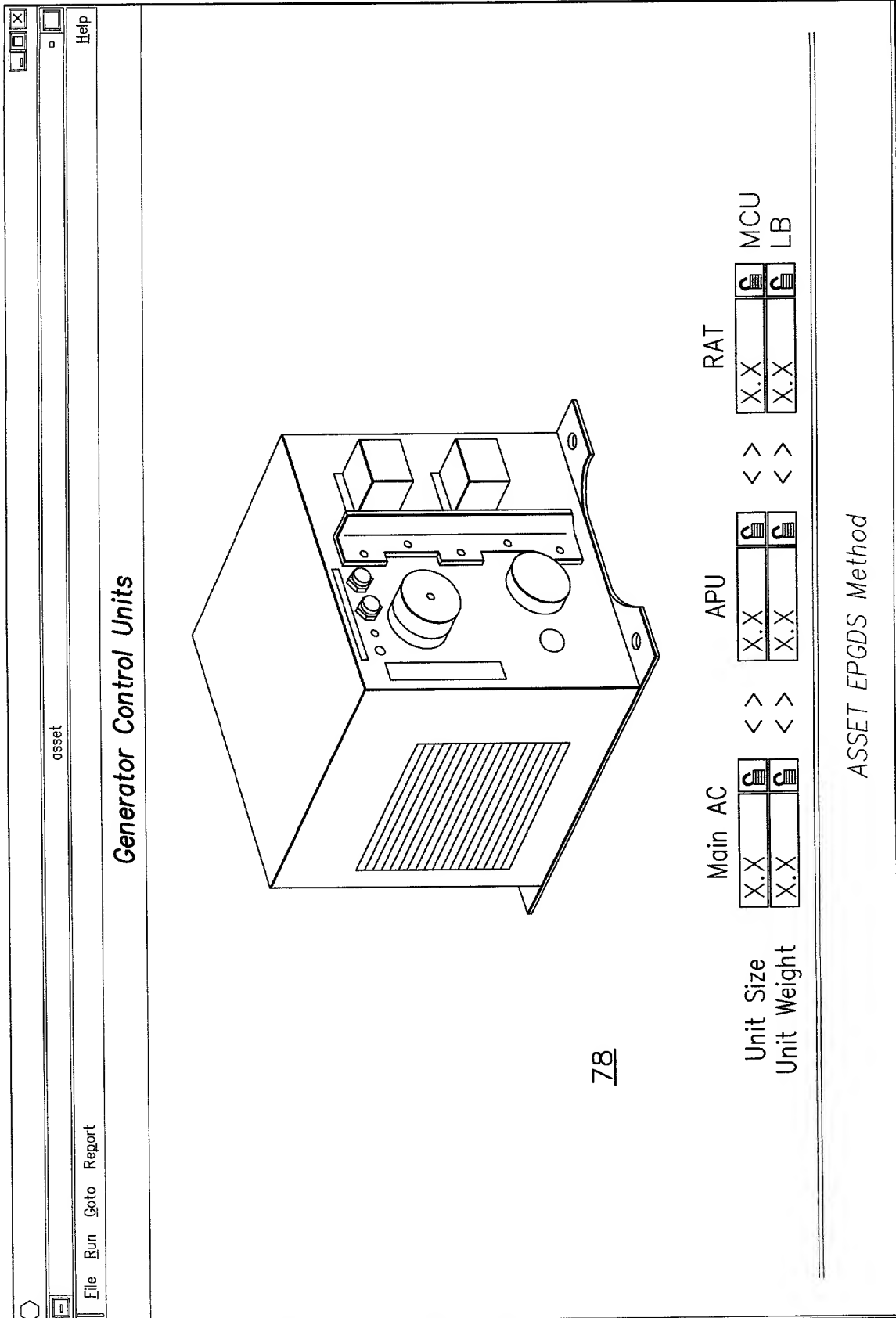
☐ LB

76

ASSET EPGDS Method

FIG. 22

29/87



78

FIG. 23

INVENTOR: BOND, et al.

SN: 09/900,522; FILED 7/6/01

ATTY: MARK D. ELCHUK; PHONE: (248) 641-1229

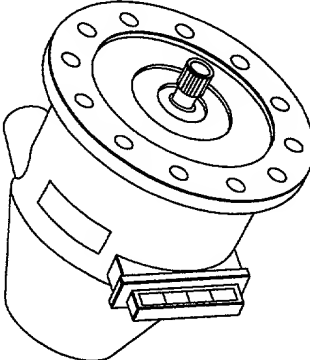
30/87

206010" 22500550

File Run Goto Report
asset
Help

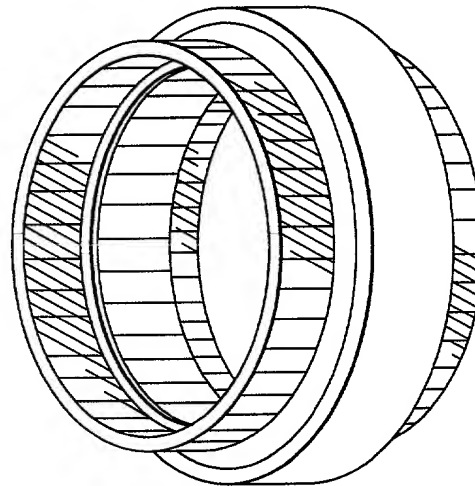
Back Up AC Power

VSCF



Generator Type	XXXXXX	▼
Capacity	XX.X	▼
Cooling Method	XXXXXX	▼
Input speed	XXXXX.X	▼
Generator Weight	XX.X	▼

PMGs



Number/Engine	X	▼
PMG Configuration	XXXXXX	▼
PMG Unit Weight	X.X	▼

ASSET EPGDS Method

Converter Configuration	XXXXXX	▼
Converter Weight	XX.X	▼

80

FIG. 24

31/87

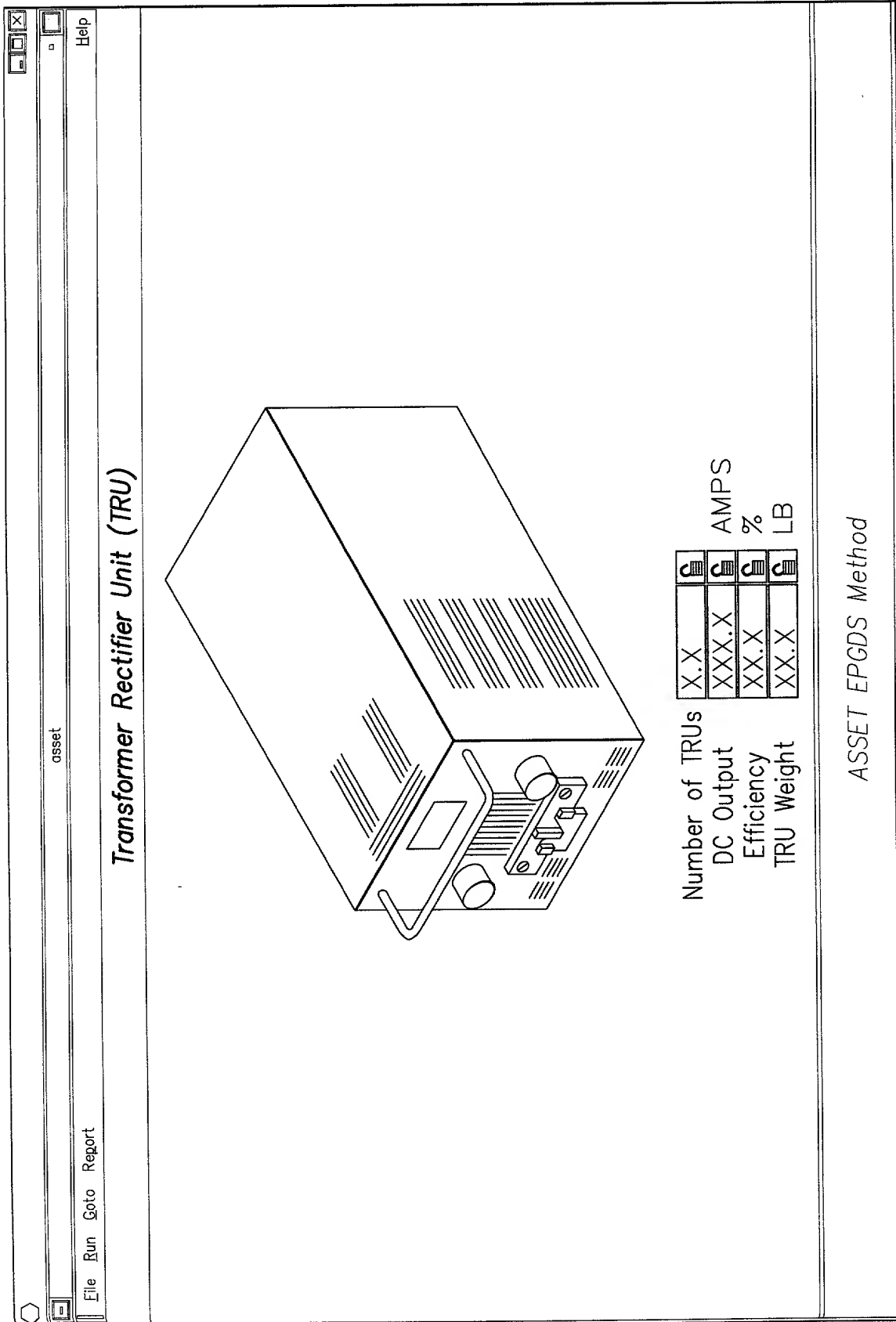


FIG. 25

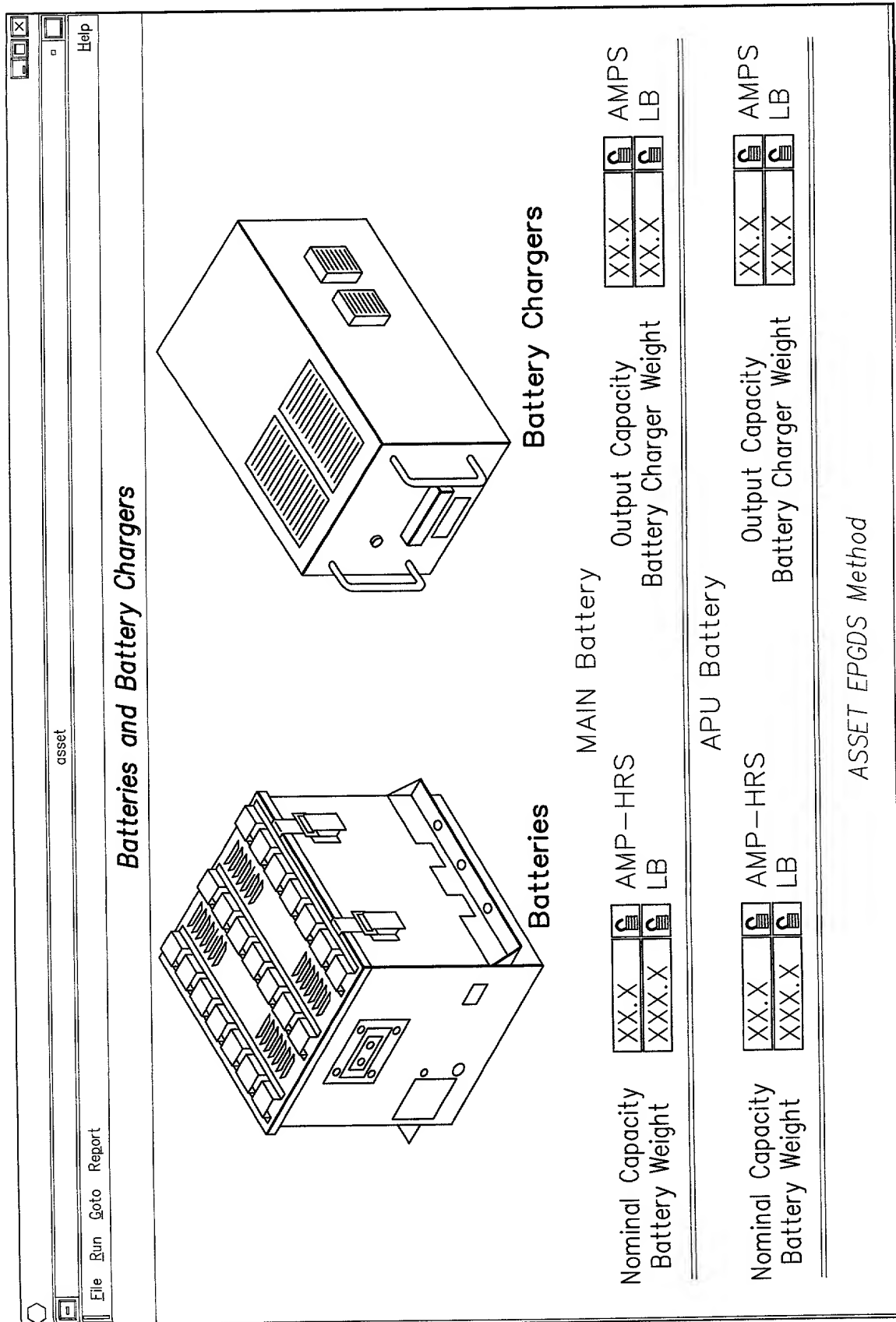


FIG. 26



206010"22500650

INVENTOR: BOND, et al.

SN: 09/900,522; FILED 7/6/01

ATTY: MARK D. ELCHUK; PHONE: (248) 641-1229

33/87

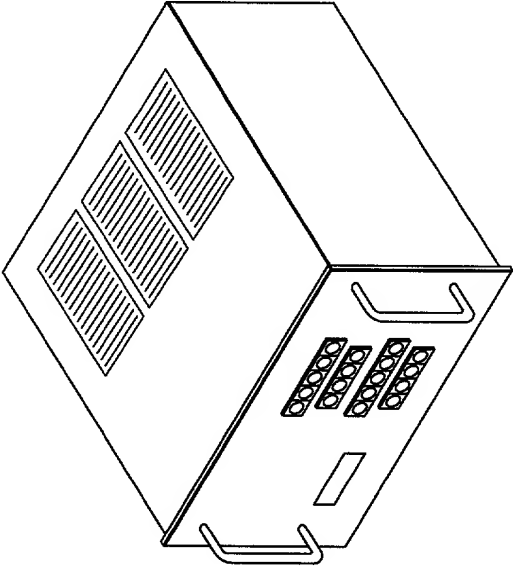
FileRunGotoReport

asset

Help

Flight Control DC Power

Power Supply Assemblies (PSAs)



Output Power

XXX.X

WATTS

Converter Architecture

Xxxx Xxxxxxxx

LB

PSA Cabinet Weight

XX.X

LB

Number of Dedicated Batteries

X

LB

PSA Battery Unit Weight

XX.X

LB

ASSET EPGDS Method

FIG. 27

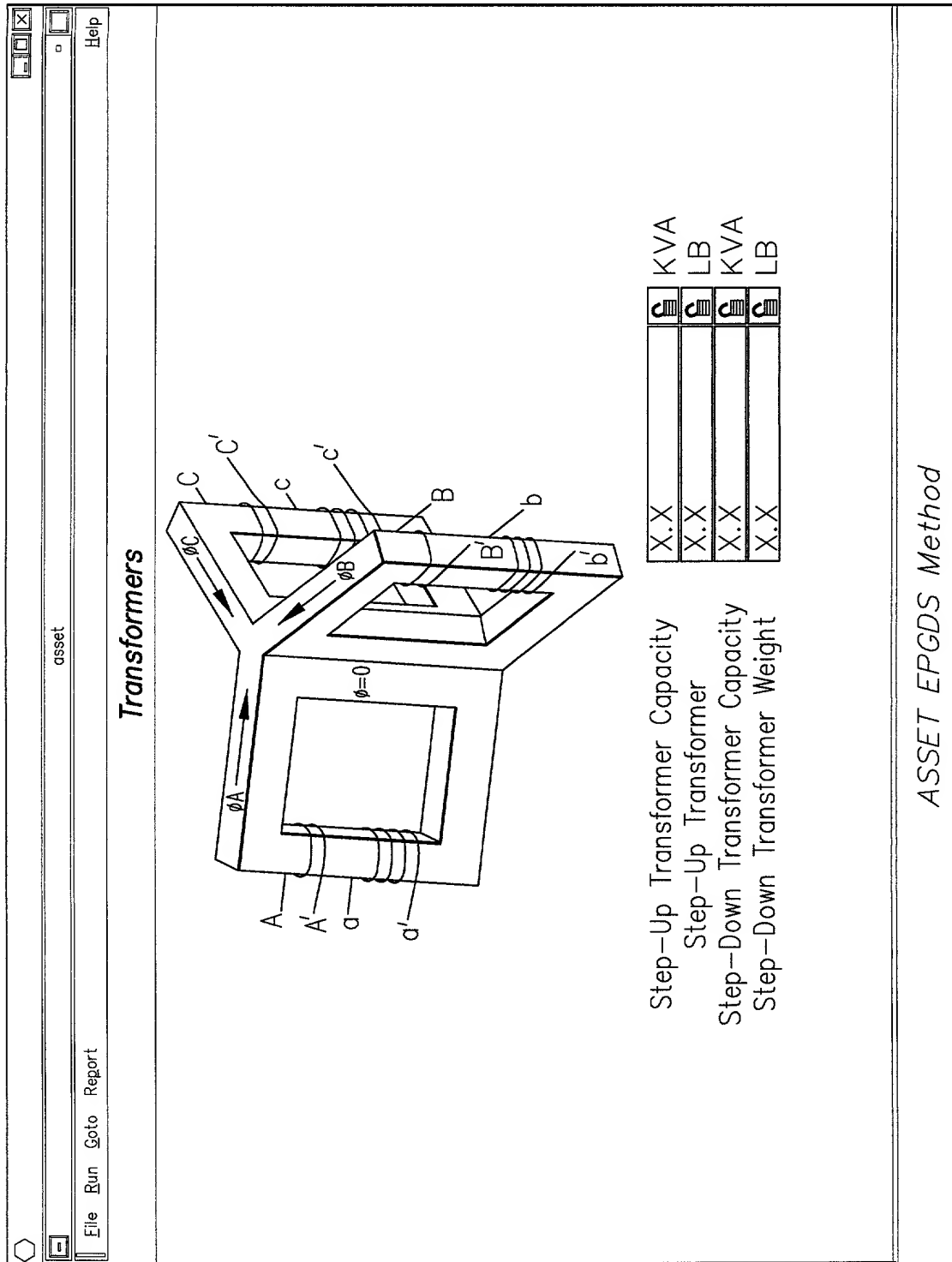


FIG. 28

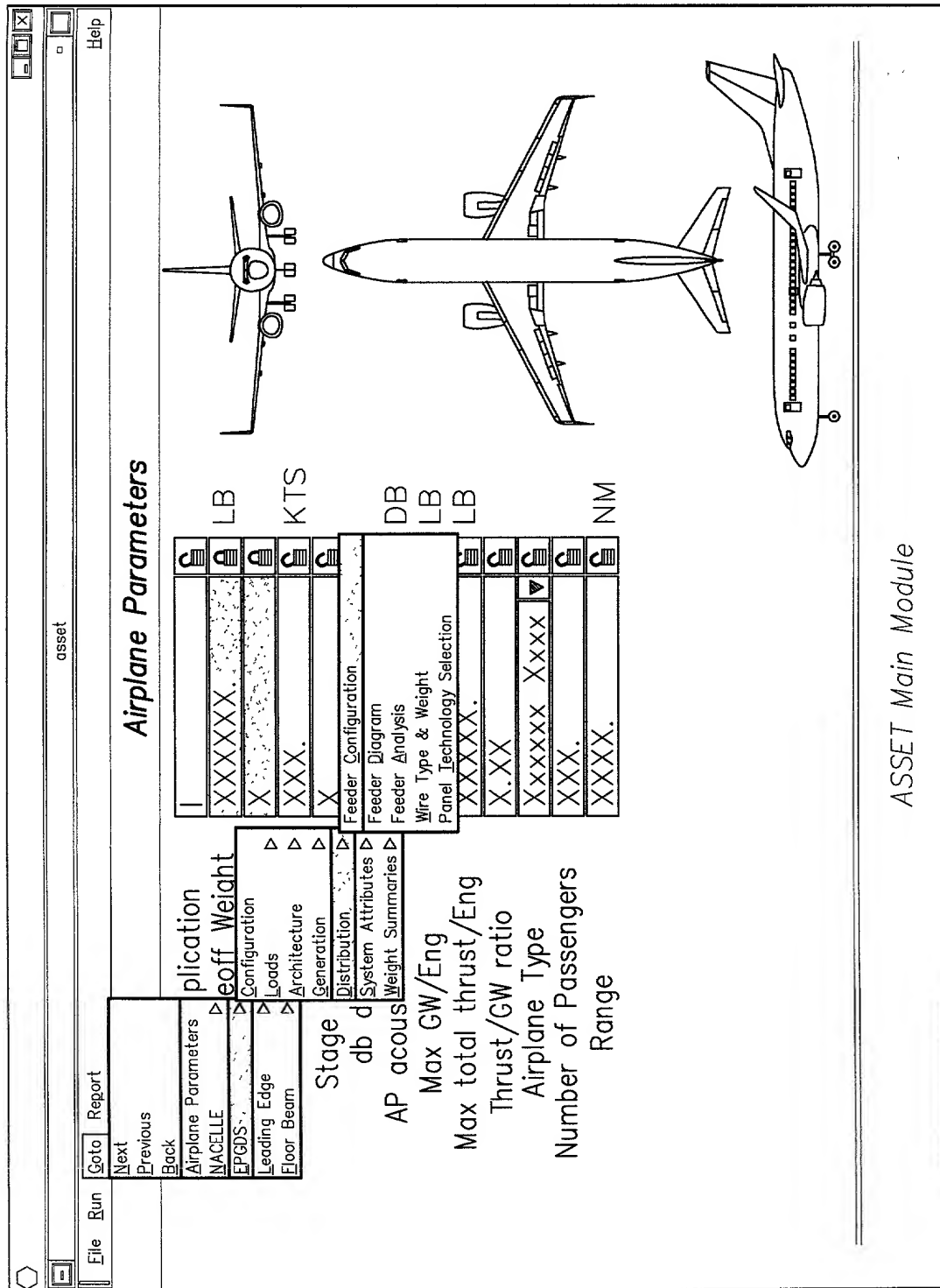


FIG. 29

FIG. 30

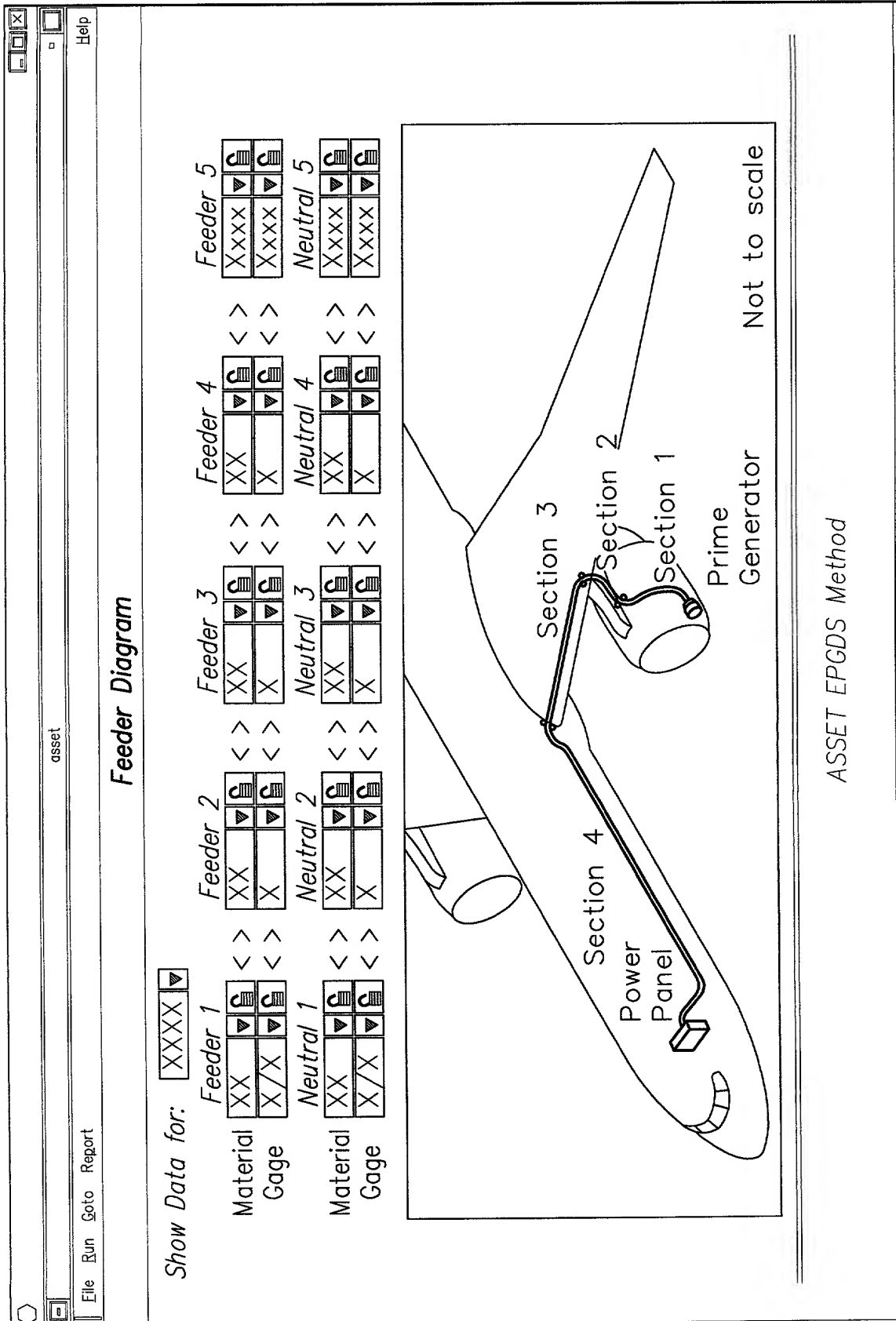


FIG. 31

File Run Goto Report

asset

Help

Feeder Analysis

Show Data for: XXXX ▾

	Feeder 1	Feeder 2	Feeder 3	Feeder 4	Feeder 5
Phase Current	XXX.X	XXX.X	XXX.X	XXX.X	XXX.X
Feeder Temperature Rise	XX.X	XX.X	XX.X	XX.X	XX.X
Bundle Derating	X.XXX	X.XXX	X.XXX	X.XXX	X.XXX
Sizing Altitude	XXXX ▾	XXXX ▾	XXXX ▾	XXXX ▾	XXXX ▾
Altitude Derating	X.XXX	X.XXX	X.XXX	X.XXX	X.XXX
Ambient Temperature	XXX.X	XX.X	XX.X	XX.X	XX.X
Feeder Temperature	XXX.X	XXX.X	XXX.X	XXX.X	XXX.X
Max Wire Temperature	XXX.X	XXX.X	XXX.X	XXX.X	XXX.X
Temperature Margin	XX.X	XXX.X	XX.X	XX.X	XXX.X
Feeder Length	X.XX	XX.XX	XX.XX	XX.XX	X.XX

Maximum Voltage Drop

XX.XXX

VOLTS

Total Voltage Drop

X.XXX

VOLTS

Voltage Drop Margin

X.XXX

VOLTS

ASSET EPGDS Method

FIG. 32

File Run Goto Report

asset

Help

Wire Type & Weight

Show Data for:

Wire Type, Feeder 1:	<input type="text" value="XXX XX-XX XXXX X"/>	<input type="text" value="XX.X"/>	<input type="text" value="LB"/>
Wire Type, Neutral 1:	<input type="text" value="XXX XX-XX XXXX X"/>	<input type="text" value="X.X"/>	<input type="text" value="LB"/>
Wire Type, Feeder 2:	<input type="text" value="XXX XX-XX XXXX X"/>	<input type="text" value="XX.X"/>	<input type="text" value="LB"/>
Wire Type, Neutral 2:	<input type="text" value="XXX XX-XX XXXX X"/>	<input type="text" value="X.X"/>	<input type="text" value="LB"/>
Wire Type, Feeder 3:	<input type="text" value="XXX XX-XX XXXX X"/>	<input type="text" value="XX.X"/>	<input type="text" value="LB"/>
Wire Type, Neutral 3:	<input type="text" value="XXX XX-XX XXXX X"/>	<input type="text" value="X.X"/>	<input type="text" value="LB"/>
Wire Type, Feeder 4:	<input type="text" value="XXX XX-XX XXXX X"/>	<input type="text" value="XX.X"/>	<input type="text" value="LB"/>
Wire Type, Neutral 4:	<input type="text" value="XXX XX-XX XXXX X"/>	<input type="text" value="XX.X"/>	<input type="text" value="LB"/>
Wire Type, Feeder 5:	<input type="text" value="XXX XX-XX XXXX XX"/>	<input type="text" value="X.X"/>	<input type="text" value="LB"/>
Wire Type, Neutral 5:	<input type="text" value="XXX XX-XX XXXX XX"/>	<input type="text" value="X.X"/>	<input type="text" value="LB"/>
TRU Feeder Weight		<input type="text" value="X.X"/>	<input type="text" value="LB"/>
Total Wire Weight		<input type="text" value="XX.X"/>	<input type="text" value="LB"/>

ASSET EPGDS Method

FIG. 33

INVENTOR: BOND, et al.

SN: 09/900,522; FILED 7/6/01

ATTY: MARK D. ELCHUK; PHONE: (248) 641-1229

40/87




206070" 22300660

Panel Technology Selection

asset

File Run Goto Reports Help

Technology Factors:

Backplane	X.XX	
ELMS	X.XX	
Other	X.XX	

ASSET EPGDS Method

FIG. 34



41/87

File Run Goto Report

Next  
Previous  
Back

Airplane Parameters  
NACELLE  
EPGDS  
Leading Edge  
Floor Beam

Stage  
db d  
AP acous  
Max GW/Eng  
Max total thrust/Eng  
Thrust/GW ratio  
Airplane Type  
Number of Passengers  
Range

### Airplane Parameters

	LB	KTS	DR
XXXXXX.			
XXX.			
X			
Dependability Cost			
Reliability			
Maintainability			
XXXXXX.			
X.XX			
XXXXXX			
XXX.			
XXXX.			

Common Dependability Cost Inputs

System Acquisition Costs

Fuel Costs

Spare Costs

Line Maintenance Costs

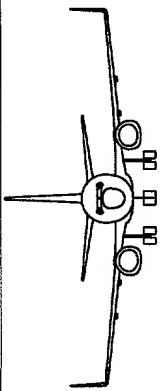
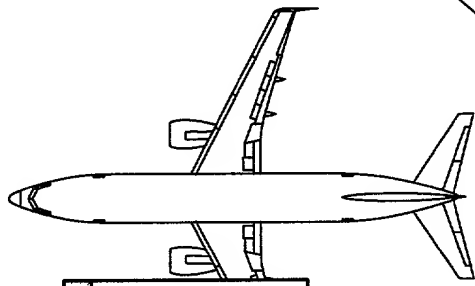
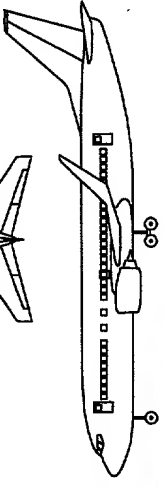
Shop Maintenance Costs

Scheduled Maintenance Costs

Schedule Interruption Costs

Dependability Cost Summary

NM

ASSET Main Module

FIG. 35

Common Dependability Cost Inputs		
Number of Main Generators per Airplane	X	
Average Number of Flights per Year per Airplane	XXXX.	
Average Flight Hours per Flight	XXX.X	HRS
Airplane Feet Size	XX	YEARS
Length of System Life in Years (1 - 30 Yrs.)	XX	%
Average Non-fuel Inflation Rate beyond Present Year	X.XXX	%
Minimum Attractive Rate of Return	X.XX	

FIG. 36

43/87

System Acquisition Costs	
System Acquisition Cost, Base Year (per fleet)	X. DOLLARS
System Support Equipment Cost, Base Year (per fleet)	X. DOLLARS
System Initial Training Cost, Base Year (per fleet)	X. DOLLARS
System Acquisition Cost per Airplane per Year	XXXX. DOLLARS
ASSET EPGDS Method	

FIG. 37

asset

Help

File

Run

Goto

Report

Fuel Costs

Fuel cost per Gallon, Base Year

Lbs Fuel Burned/Flight Hour/Lb Additional Weight

System Weight (per airplane)

System Direct Horsepower Requirement (per airplane)

System Drag Horsepower Requirement (per airplane)

System Cooling Horsepower Requirement

System Pound of Fuel per Block Trip (per airplane)

Average Fuel Inflation Rate Beyond Present Year

X.XX

X.XXXX

XXX.X

X.

X.

X.

X.

X.XXX

DOLLARS

HRS^-1

LB

HP

HP

HP

LB

%

Fuel Cost (NPV of Life Cycle Cost)

Fuel Cost per Airplane per Year

XXXXXXX.

XXXX.

DOLLARS

DOLLARS

ASSET EPGDS Method

FIG. 38

Spares Costs	
Cost/Spare Unit, Base Year	
Spares Holding Factor	
Shop Turnaround Time in Days	
Main Base Fill Rate (must be less than 1)	
Mean Time Between Unscheduled Removals	
Mean Time Between Overhauls	
Number of Spares Required	
Initial Spares Cost	
Spares Holding Cost (NPV of Life Cycle Cost)	
Spares Cost (NPV of Life Cycle Cost)	
Spares Cost per Airplane per Year	

FIG. 39

asset		Help	
File Run Goto Report			
Line Maintenance Costs			
Direct Labor Rate per Hour	XX.XX		DOLLARS/HOUR
Maintenance Labor Burden Factor	X.X		
Mean Time Between Unscheduled Removals	XXXXX.		HRS
Line Labor Hours Required per Removal	X.X		HRS
Line Labor Hours per Maintenance Action (Non-Removal)	X.X		HRS
Maintenance Actions per 1000 Flight Hours (Non-Removal)	X.XX		HRS^-1
Line Maintenance Cost (NPV of Life Cycle Cost)	XXXXX.		DOLLARS
Line Maintenance Cost per Airplane per Year	XXX.		DOLLARS
ASSET EPGDS Method			

FIG. 40

asset		Help	
File Run Goto Report			
Shop Maintenance Costs			
Direct Labor Rate per Hour	XX.XX		DOLLARS/HOUR
Maintenance Labor Burden Factor	X.X		
Mean Time Between Unscheduled Removals	XXXXX.		HRS
Main Generator Mean Time Between Failures	XXXXX.		HRS
Mean Time Between Overhauls	X.		HRS
Shop Labor Man-Hours per Unconfirmed Failure (Test Time)	X.X		HRS
Shop Labor Man-Hours per Failure (Repair and Test)	XX.X		HRS
Shop Labor Hours per Overhaul	X.X		HRS
Average Shop Material Cost per Failure, base year	XXXXX.		DOLLARS
Overhaul Materials Cost per Overhaul	X.		DOLLARS
Shop Maintenance Cost (NPV of Life Cycle Cost)	XXXXXXXX.		DOLLARS
Shop Maintenance Cost per Airplane per Year	XXXXX.		DOLLARS
ASSET EPGDS Method			

FIG. 41

File Run Goto Report		asset		Help	
Scheduled Maintenance Costs					
Direct Labor Rate per Hour	XX.XX				DOLLARS/HOUR
Maintenance Labor Burden Factor	X.X				
Mean Time Between Unscheduled Removals	XXXXX.				HRS
Schedule Maintenance Inspection Man Hours per 1000 Flight Hours	X.X				
Rectification Man Hours per 1000 Flight Hours	X.X				
Scheduled Maintenance Material Dollars per 1000 Flight Hours	X.XX				HRS^-1
Scheduled Maintenance Cost (NPV of Life Cycle Cost)	XXXXXXXX.				DOLLARS
Scheduled Maintenance Cost per Airplane per Year	XXXX.				DOLLARS
ASSET EPGDS Method					

FIG. 42



49/87

Schedule Interruption Costs	
Average Delay Cost per Delay Hour	XXXXX. DOLLARS/HOUR
Average Cancellation Cost per Cancellation	XXXXX. DOLLARS/HOUR
Average Air Turnback Cost per Turnback	XXXXX. DOLLARS
Average Diversion Cost per Diversion	XXXXX. DOLLARS
Number of Delays per 100 Departures	X.XXXX HRS
Average Delay Time (Hours)	X.XX HRS
Number of Cancellations per 100 Departures	X.XXXX HRS
Number of Air Turnbacks per 100 Departures	X.XXXX HRS
Number of Diversions per 100 Departures	X.XXXX HRS
Schedule Interruptions Cost (NPV of Life Cycle Cost)	XXXXXXX. DOLLARS
Schedule Interruptions Cost per Airplane per Year	XXXXX. DOLLARS
ASSET EPGDS Method	

FIG. 43

Dependability Cost Summary			
83a	Line Maintenance Cost	NPV of Life Cycle Cost	Per Airplane per Year 83b
	Shop Maintenance Cost	XXXXX.	XXXXX. DOLLARS
	Scheduled Maintenance Cost	XXXXXXXXX.	XXXXXXXXX. DOLLARS
	Schedule Interruptions Cost	XXXXXXXXX.	XXXXXXXXX. DOLLARS
	Spares Cost	XXXXXXXXX.	XXXXXXXXX. DOLLARS
	Fuel Cost	XXXXXXXXX.	XXXXXXXXX. DOLLARS
Dependability Cost		XXXXXXXXX.	XXXXXXXXX. DOLLARS
83			
ASSET EPGDS Method			

FIG. 44

51/87

File Run Goto Report

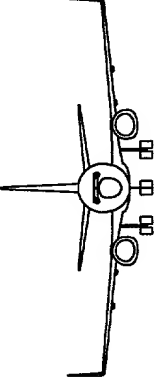
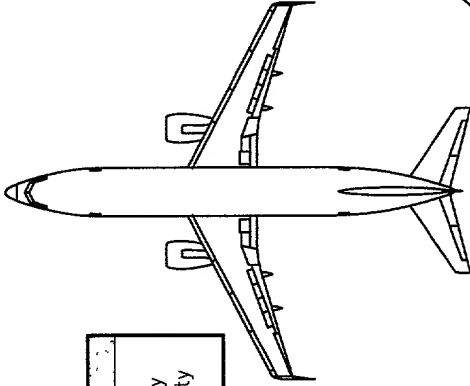
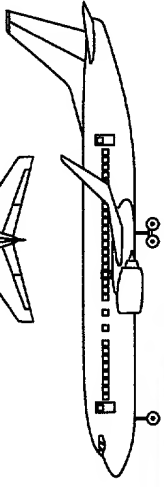
Next  
Previous  
Back

Airplane Parameters  
NACELLE  
EPGDS  
Leading Edge  
Floor Beam

Stage  
db d  
AP acous  
Max GW/Eng  
Max total thrust/Eng  
Thrust/GW ratio  
Airplane Type  
Number of Passengers  
Range

### Airplane Parameters

	LB	KTS	DB	NM
I	XXXXXX.			
coeff Weight	X	XXX.	X	
Configuration				
Loads				
Architecture				
Generation				
Distribution				
System Attributes				
Weight Summaries				
Dependability Cost				
Reliability				
Maintainability				
Reliability Inputs				
Main Power Reliability				
Backup Power Reliability				
Standby Power Reliability				
ECDC Power Reliability				
XXXXXX.				
X.XX				
XXXXXX				
XXX.				
XXXXX.				

ASSET Main Module

FIG. 45

FIG. 46

FIG. 46

53/87

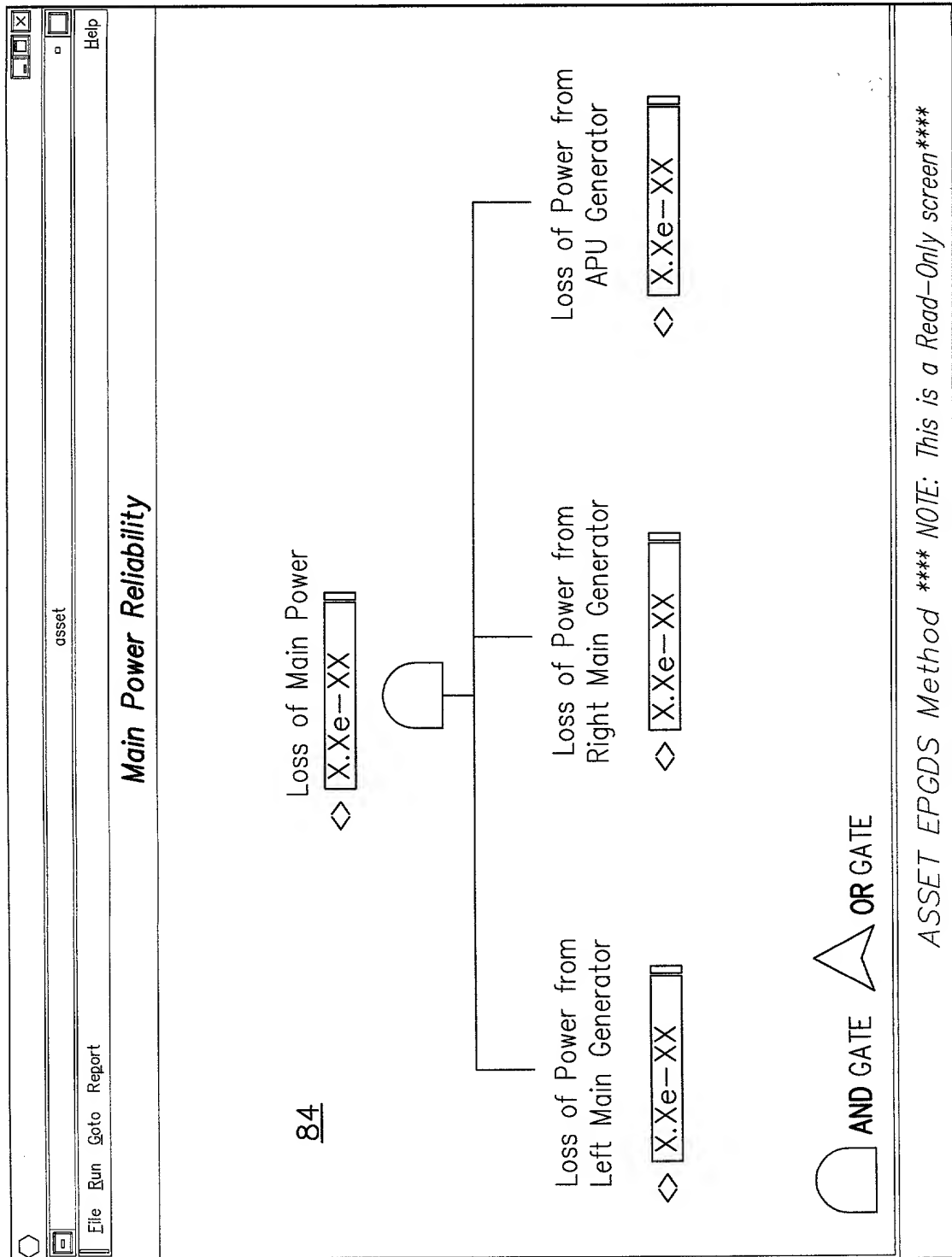


FIG. 47

54/87

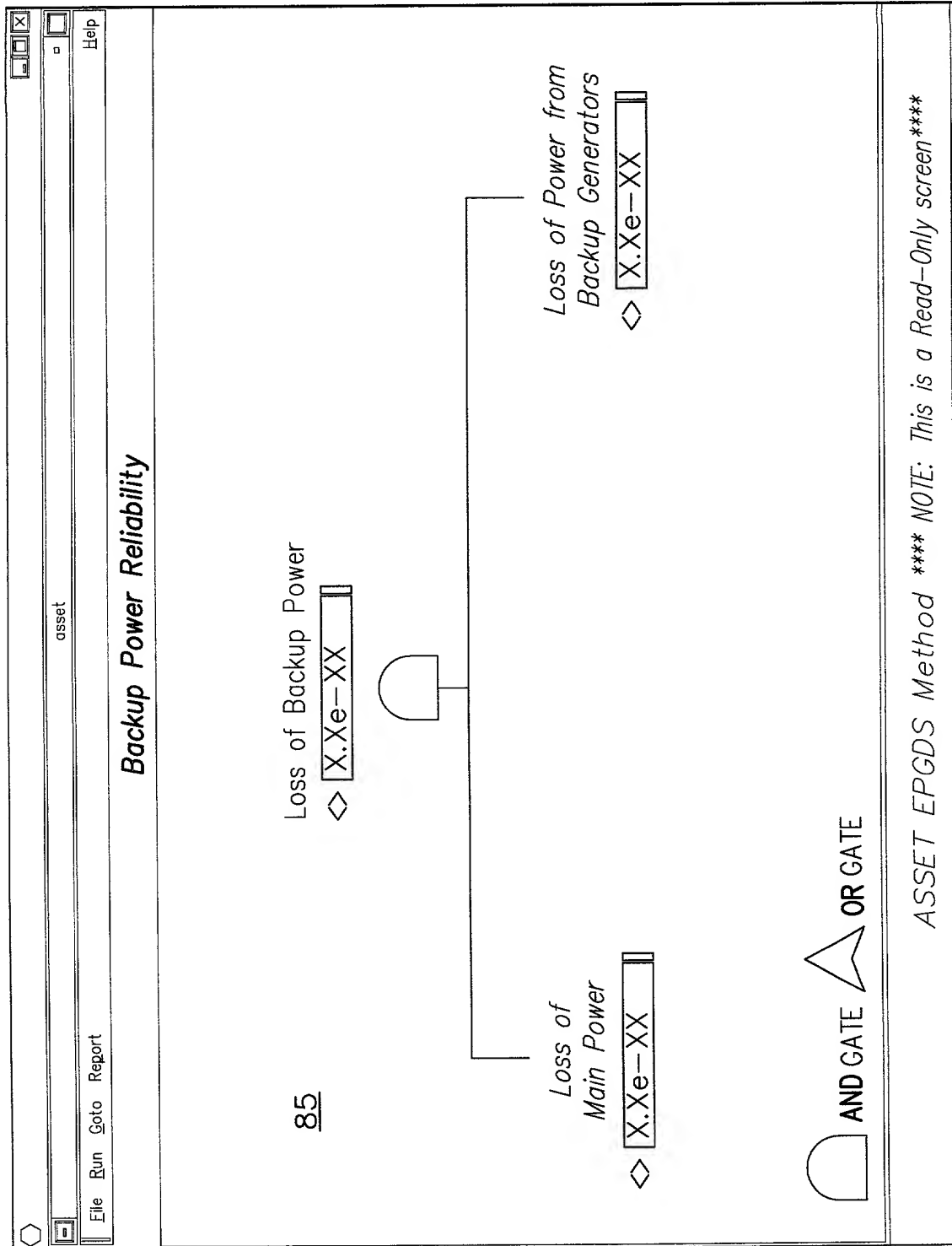


FIG. 48

55/87

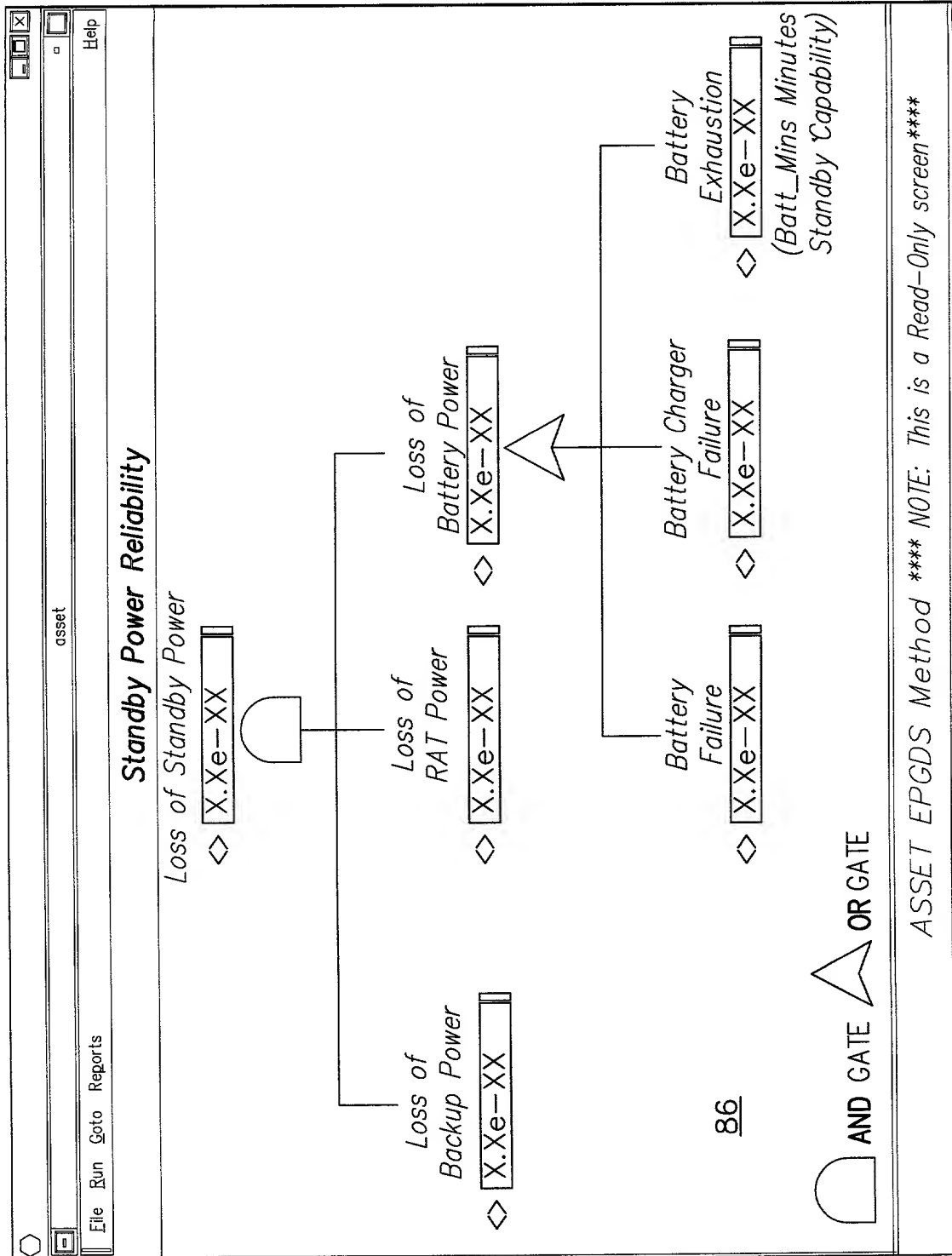


FIG. 49

56/87

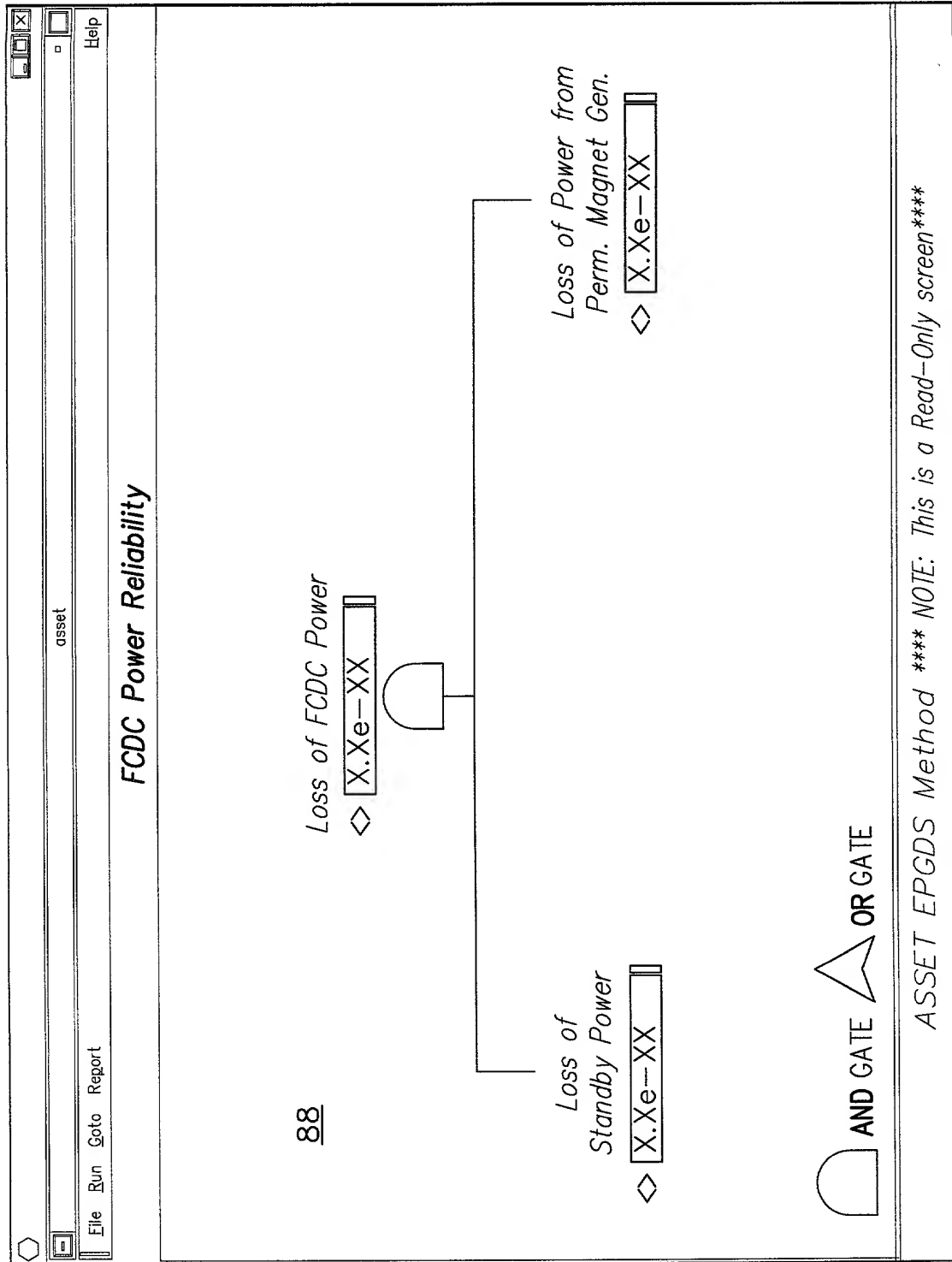


FIG. 50



57/87

[illegible]

FIG. 51

Maintenance Times			
	Unscheduled Removals	Servicing	Alignment & Adjustment
<b>Frequency (Flight Hours)</b>			
Mean Time Between Unscheduled Removals	XXXXX	XXX.	XXXX
Maintenance Interval			
<b>Maintenance Corrective Times (Flight Hours)</b>			
Main Generator Unscheduled Removal Access Time	X.XX	X.XX	X.XX
Main Generator Unscheduled Removal Fault Isolation Time	X.XX		
Repair / Removal & Replace Time	X.XX		
Main Generator Unscheduled Removal Servicing Time	X.XX	X.XX	
Main Generator Unscheduled Removal Alignment & Adjustment Time	X.XX		X.XX
Main Generator Unscheduled Removal Checkout / Verification Time	X.XX		X.XX
Main Generator Unscheduled Removal Closing Up Time	X.XX	X.XX	X.XX
Main Generator Unscheduled Removal Mean Corrective Time	X.	X.	X.
ASSET EPGDS Method			
90			

FIG. 52

Preparation Times			
	Unscheduled Removals	Servicing	Alignment & Adjustment
<b>Maintenance Preparation Times (Flight Hours)</b>			
Main Generator Unscheduled Removal Maintenance Coordination Time	X.XX	<> X.XX	<> X.XX
Main Generator Unscheduled Removal Dispatch Delay Time	X.XX		
Main Generator Unscheduled Removal Airplane Ferrying Time	X.XX		
Main Generator Unscheduled Removal Supply Delay Time	X.	<> X.XX	
Main Generator Unscheduled Removal Spares & Equipment Issuing Time	X.XX		<> X.XX
Main Generator Unscheduled Removal Transport Delay Time	X.XX		
Main Generator Unscheduled Removal Maintenance Delay Time	X.XX	<> X.XX	<> X.XX
Main Generator Unscheduled Removal Maintenance Preparation Time	X.	<> X.	<> X.
ASSET EPGDS Method			

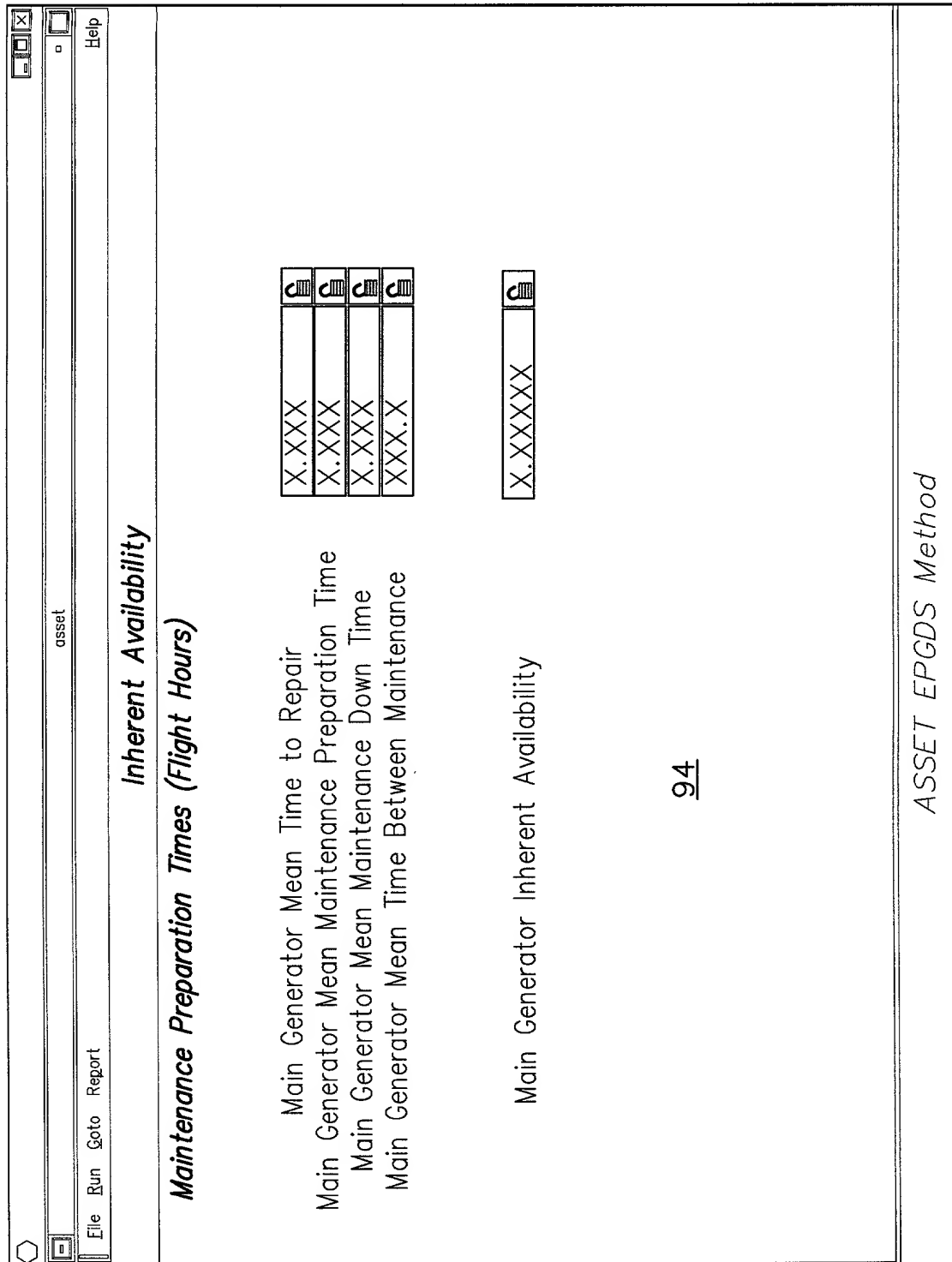


FIG. 54

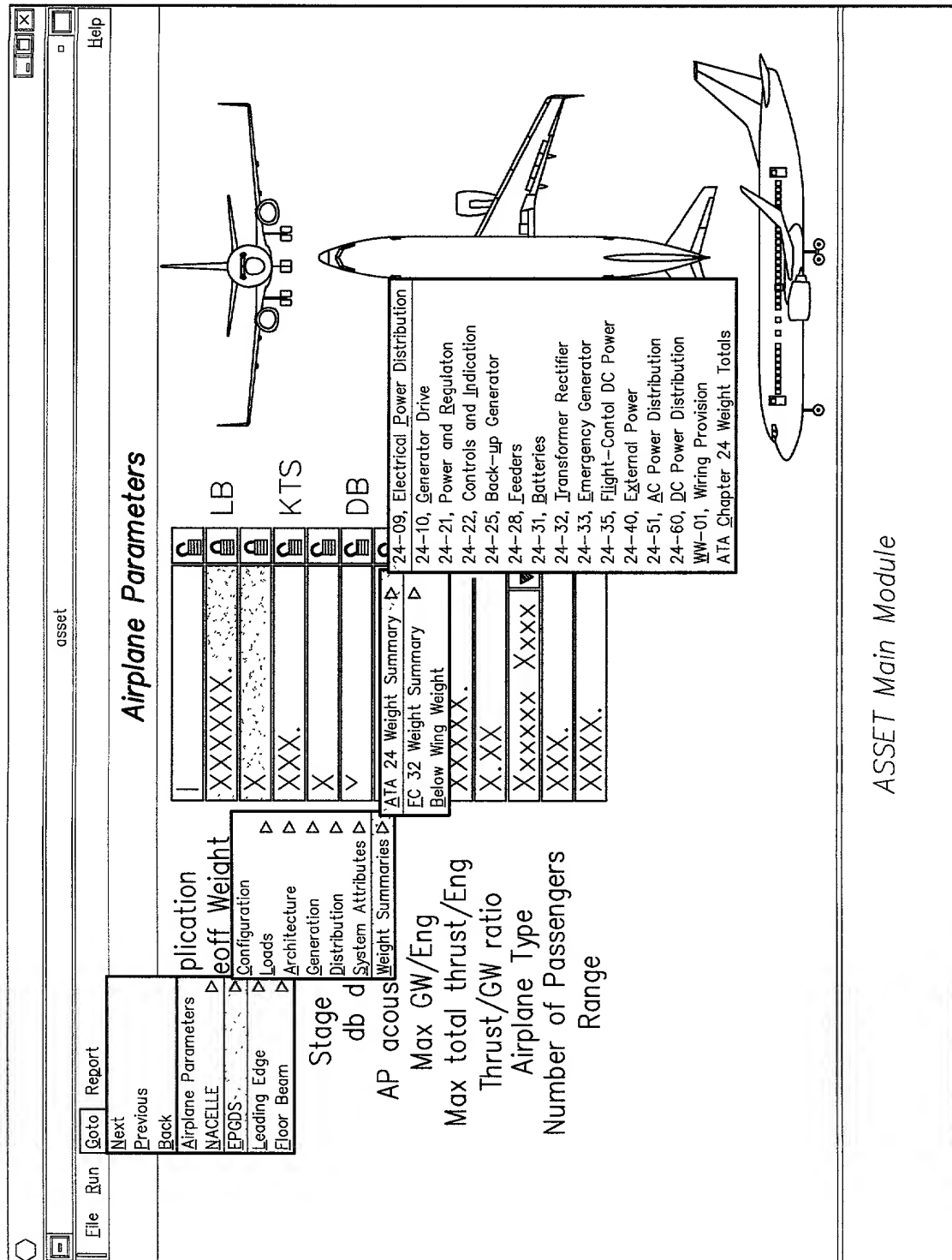


FIG. 55

FIG. 56

[illegible]

[illegible]

FIG. 58



65/87

[illegible]

FIG. 59

66/87

[illegible]

FIG. 60

FIG. 61

FIG. 62

69/87

[illegible]

FIG. 63

FIG. 64

71/87

[illegible]

FIG. 65

72/87

[illegible]

FIG. 66



FIG. 67

FIG. 68

75/87

[illegible]

FIG. 69

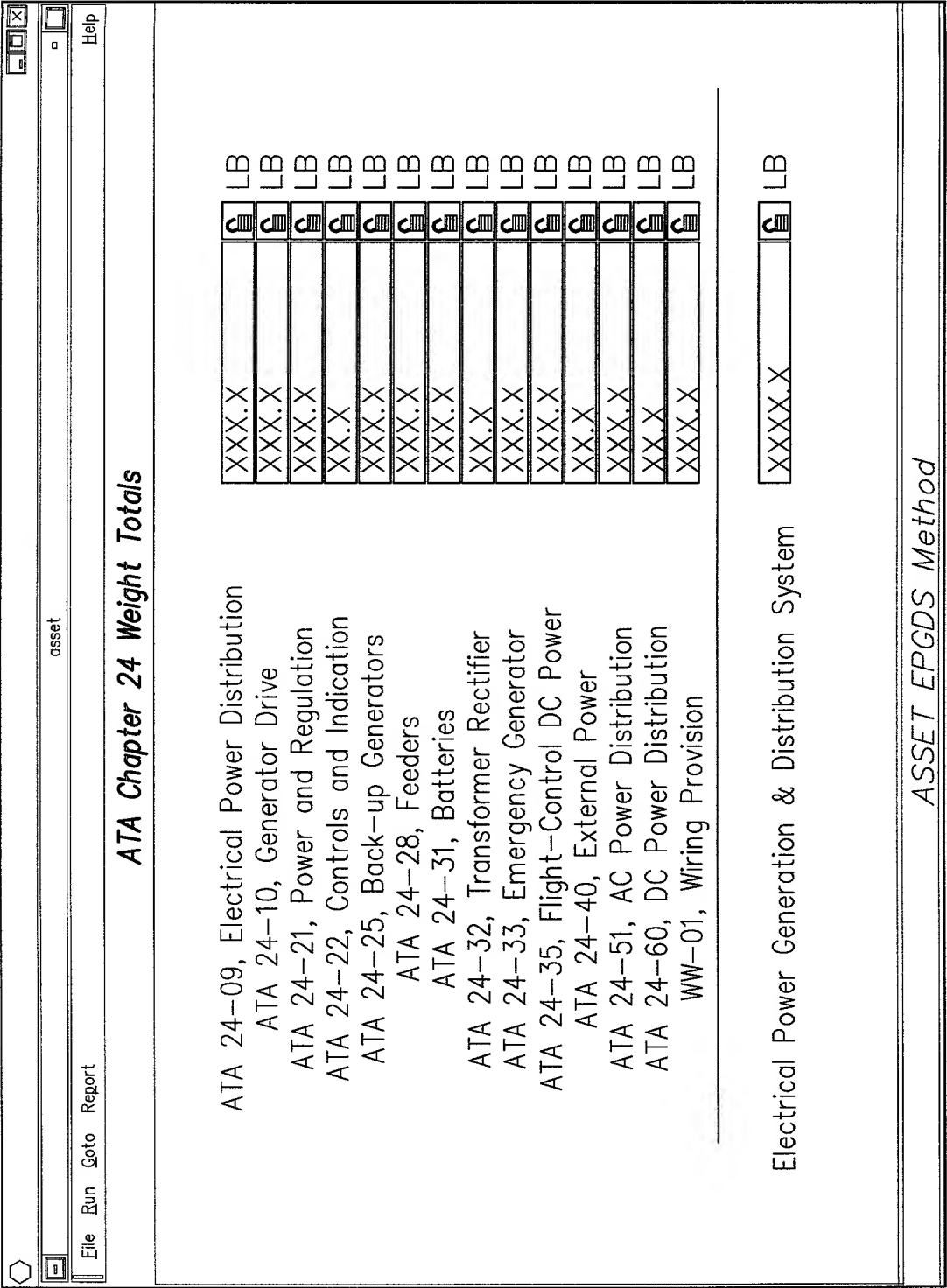


FIG. 70

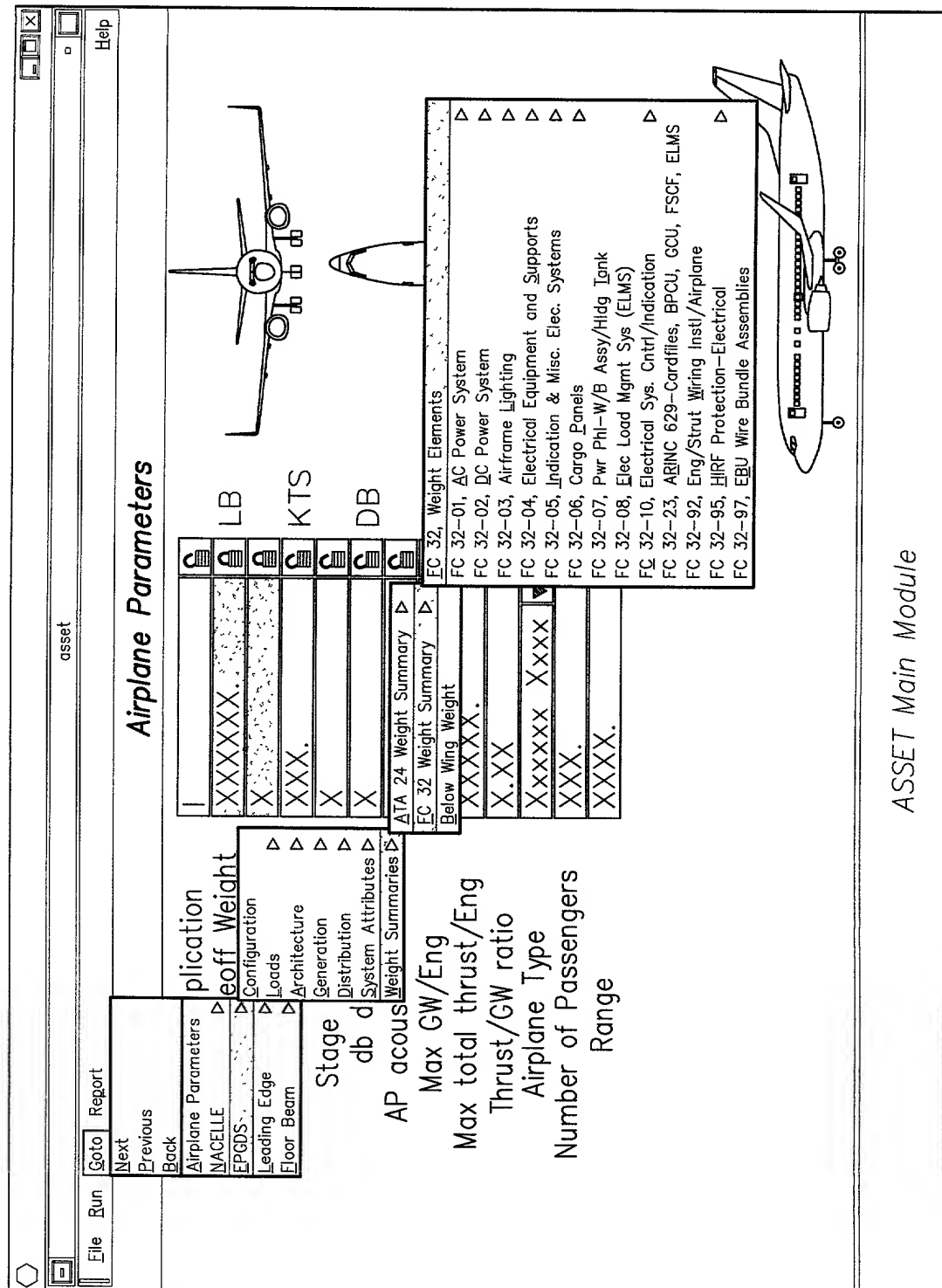


FIG. 71

206070-22500660

78/87

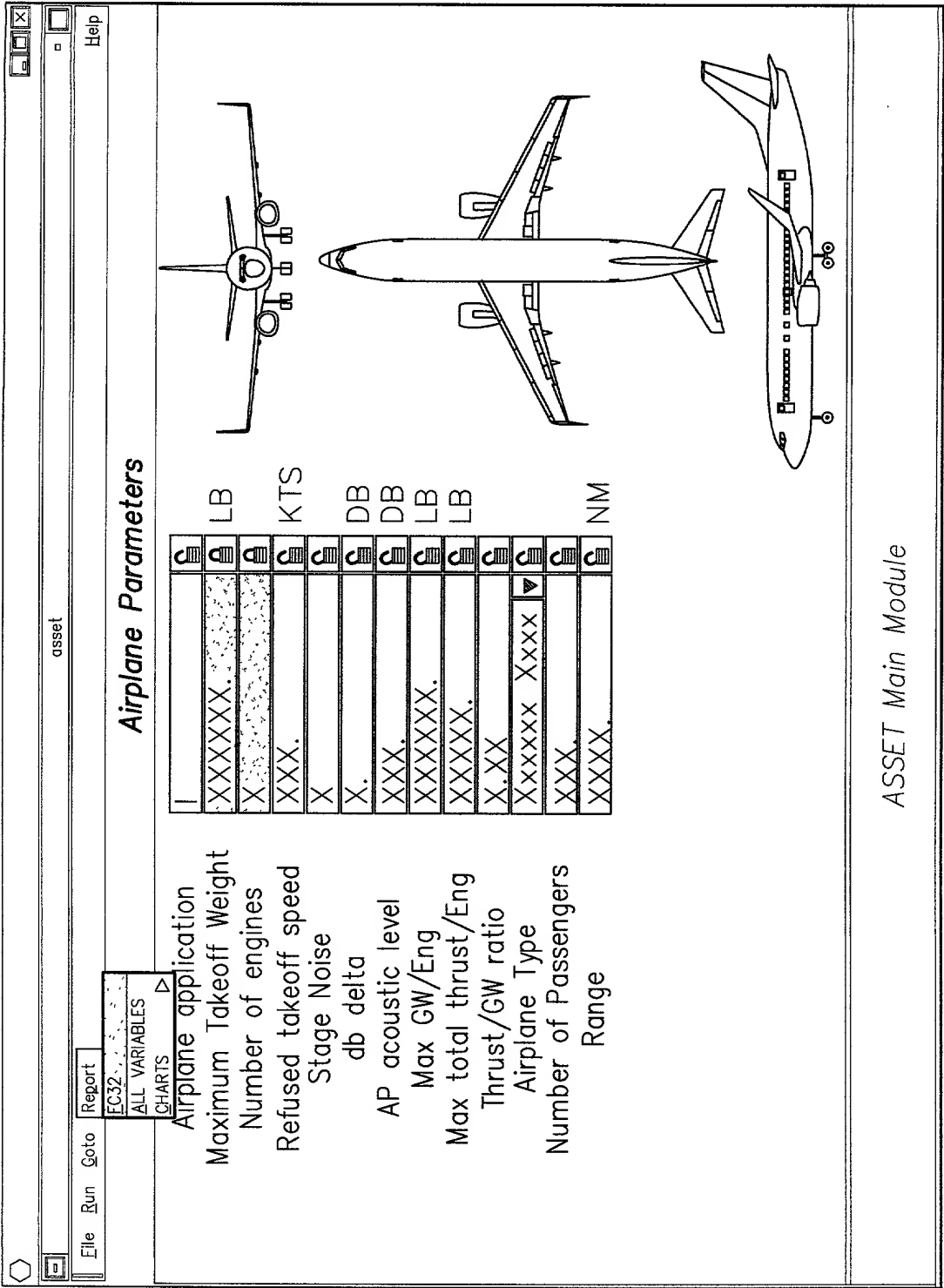


FIG. 72

INVENTOR: BOND, et al.

SN: 09/900,522; FILED 7/6/01

ATTY: MARK D. ELCHUK; PHONE: (248) 641-1229

79/87

File Run Goto Report
asset
Help

### Airplane Parameters

Airplane application

Maximum Takeoff Weight

XXXXXX.

LB

A

ASSET: Report

Component #	Component Designation	Qty	Unit	Wt (LB)	Su
32	Electrical Power Generation & Distribution System				
32-01	AC Power System	X		XXX.X	
32-01-01	AC POWER GENERATION EQUIPMENT	X		XXX.X	
32-01-01-01	MAIN AC POWER GENERATORS INSTLD	X		XX.X	
32-01-01-01-01	PRIME DRIVE GENERATOR	X		X.X	
32-01-01-01-02	QUICK ATTACH DETACH (QAD)	X		XX.X	
32-01-01-01-03	GENERATOR FLUIDS	X		X.X	
32-01-01-01-05	HARDWARE INSTALLATION	X		X.X	
32-01-01-01-06	WIRING INSTALLATION	X		X.X	
32-01-01-02	GENERATOR CONTROL UNITS	X		XX.X	
32-01-01-06	BUS POWER CONTROL UNITS	X		XXX.X	
32-01-05	EROPS-VSCF POWER GENERATION SYSTEM	X		XX.X	
32-01-05-01	VSCF GENERATORS & OIL	X		XX.X	
32-01-05-01-01	VSCF GENERATOR	X		XX.X	
32-01-05-01-02	VSCF GENERATOR OIL	X		X.X	

Return

send to printer

save to file

ASSET Main Module

FIG. 73

80/87

File Run Goto Report
asset
Help

### Airplane Parameters

Airplane application

Maximum Takeoff Weight

XXXXXX.

LB

ASSET: Report

AC_Stdby_Load	AC Standby Load	[0][0][0]
AGen_MTBf	APU Generator MTBF	[0][0][0]
APA	Airplane application	[0][0][0]
APUG_Cap	APU Generator Capacity	[0][0][0]
APUG_Cap_As_Built	APU Generator Capacity	[0][0][0]
APUG_Wt	APU Generator Weight	[0][0][0]
APU_Batt_Cap	Nominal Capacity	[0][0][0]
APU_Batt_Chgr_Cap	Output Capacity	[0][0][0]
APU_Batt_Chgr_Wt	Battery Charger Weight	[0][0][0]
APU_Batt_Chgr_Wt_As_Built	Battery Charger Weight	[0][0][0]
APU_Batt_Wt	Battery Weight	[0][0][0]
APU_Batt_Wt_As_Built	Battery Weight	[0][0][0]
APU_Ch_Prob	Probability of Lost of APU Generating Channel	[0][0][0]
APU_Feeder	APU Feeder Configuration	[0][0][0]
APU_Feeder	APU Feeder Configuration	[1][0][0]
APU_Feeder	APU Feeder Configuration	[2][0][0]
APU_Feeder	APU Feeder Configuration	[3][0][0]
APU_Feeder	APU Feeder Configuration	[4][0][0]
APU_GCU_Size	APU Generator GCU Size	[0][0][0]
APU_GCU_Wt	Unit Weight	[0][0][0]

[Return]
[send to printer]
[save to file]

95
ASSET Main Module

FIG. 74



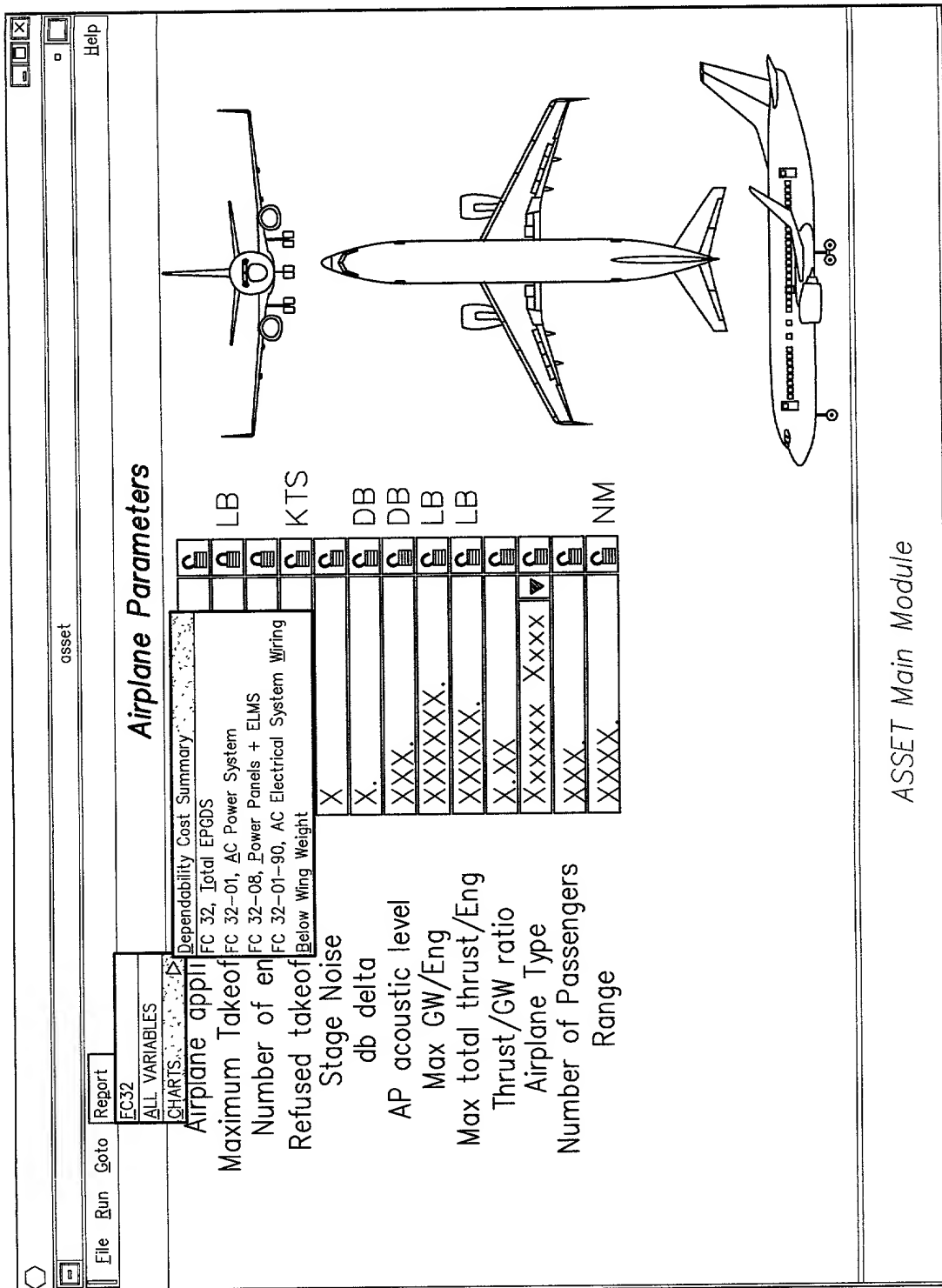


FIG. 75

INVENTOR: BOND, et al.

SN: 09/900,522; FILED 7/6/01

ATTY: MARK D. ELCHUK; PHONE: (248) 641-1229

82/87

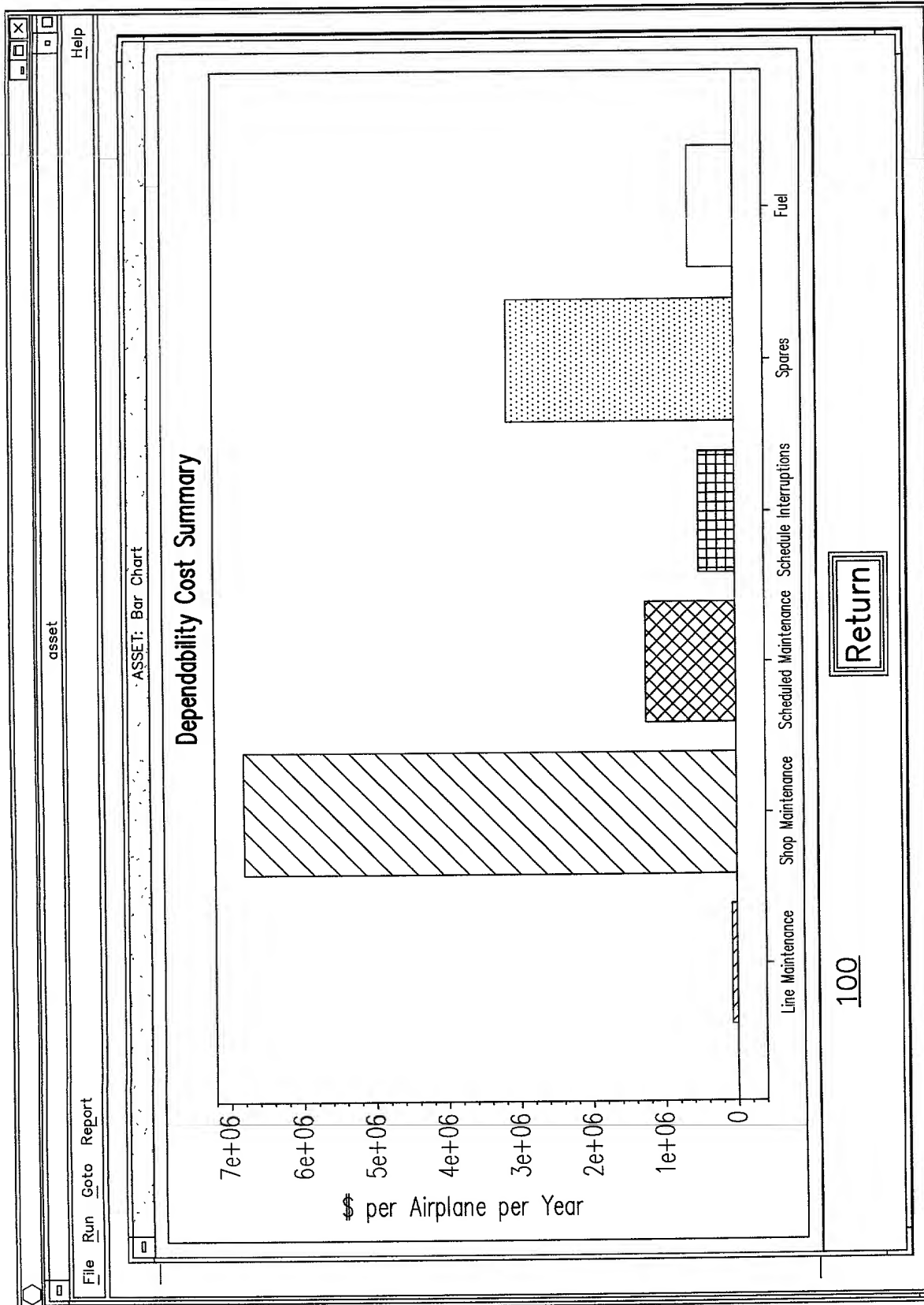


FIG. 76

INVENTOR: BOND, et al.

SN: 09/900,522; FILED 7/6/01

ATTY: MARK D. ELCHUK; PHONE: (248) 641-1229

83/87

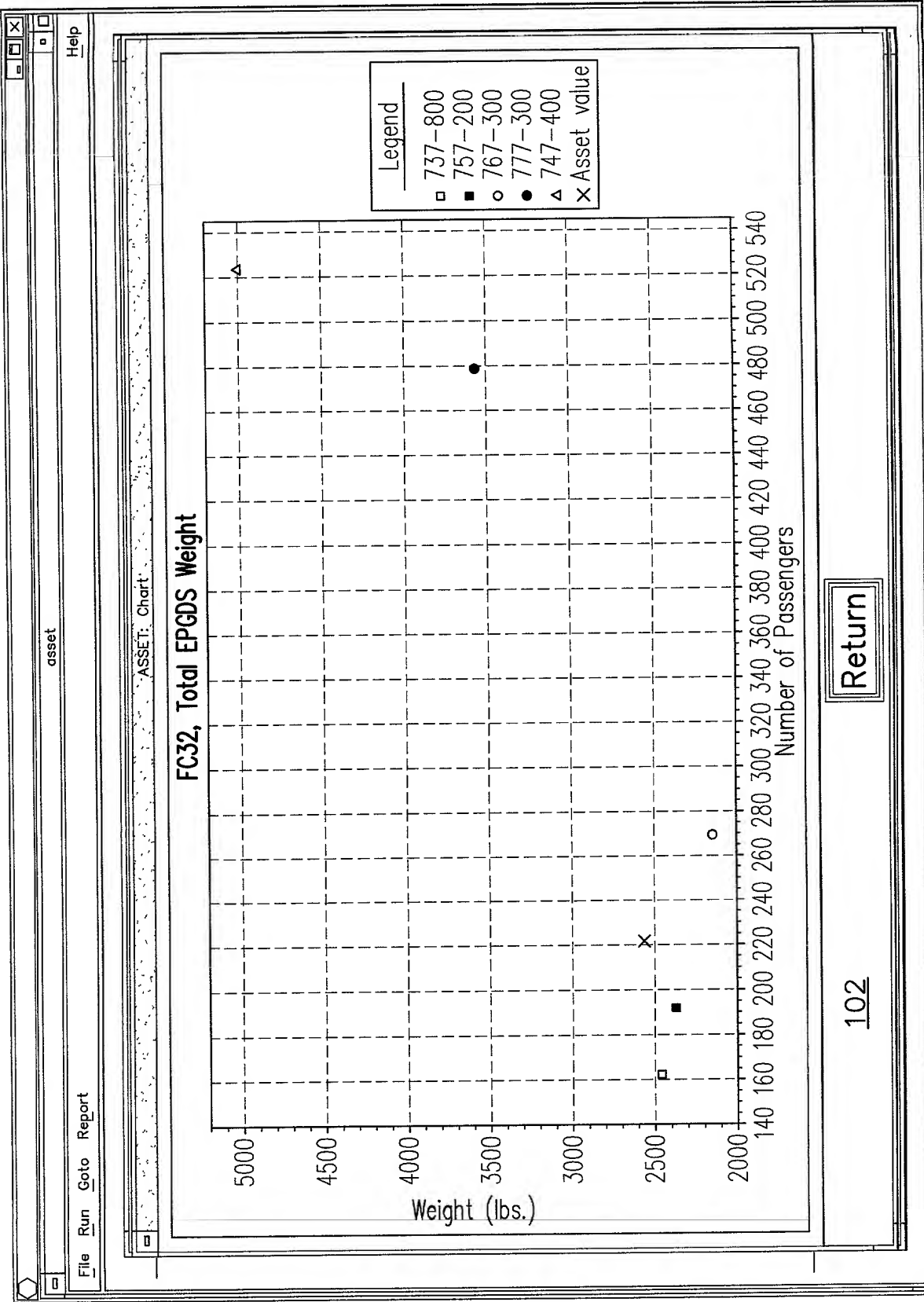


FIG. 77

INVENTOR: BOND, et al.

SN: 09/900,522; FILED 7/6/01

ATTY: MARK D. ELCHUK; PHONE: (248) 641-1229

84/87

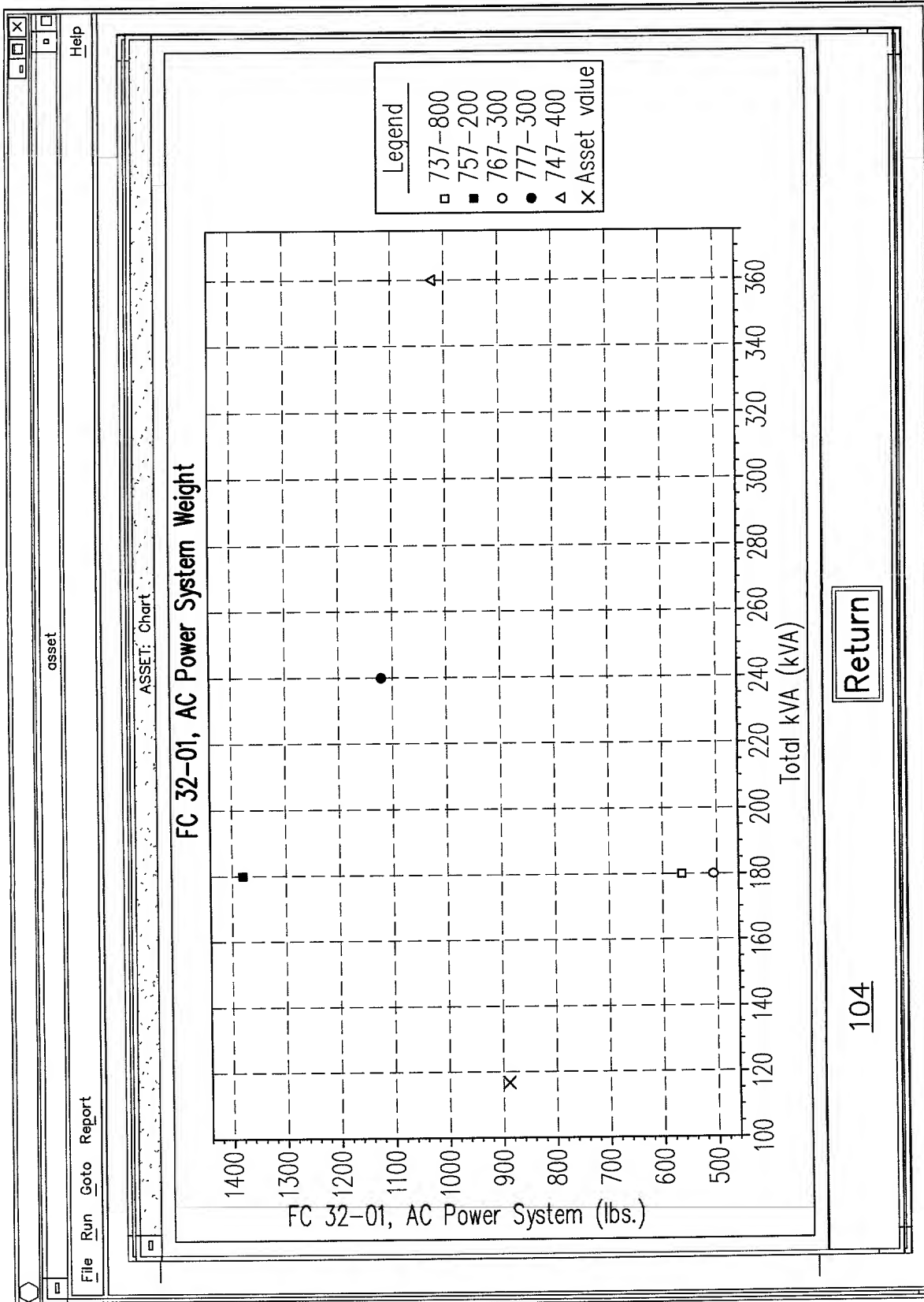


FIG. 78

INVENTOR: BOND, et al.

SN: 09/900,522; FILED 7/6/01

ATTY: MARK D. ELCHUK; PHONE: (248) 641-1229

85/87

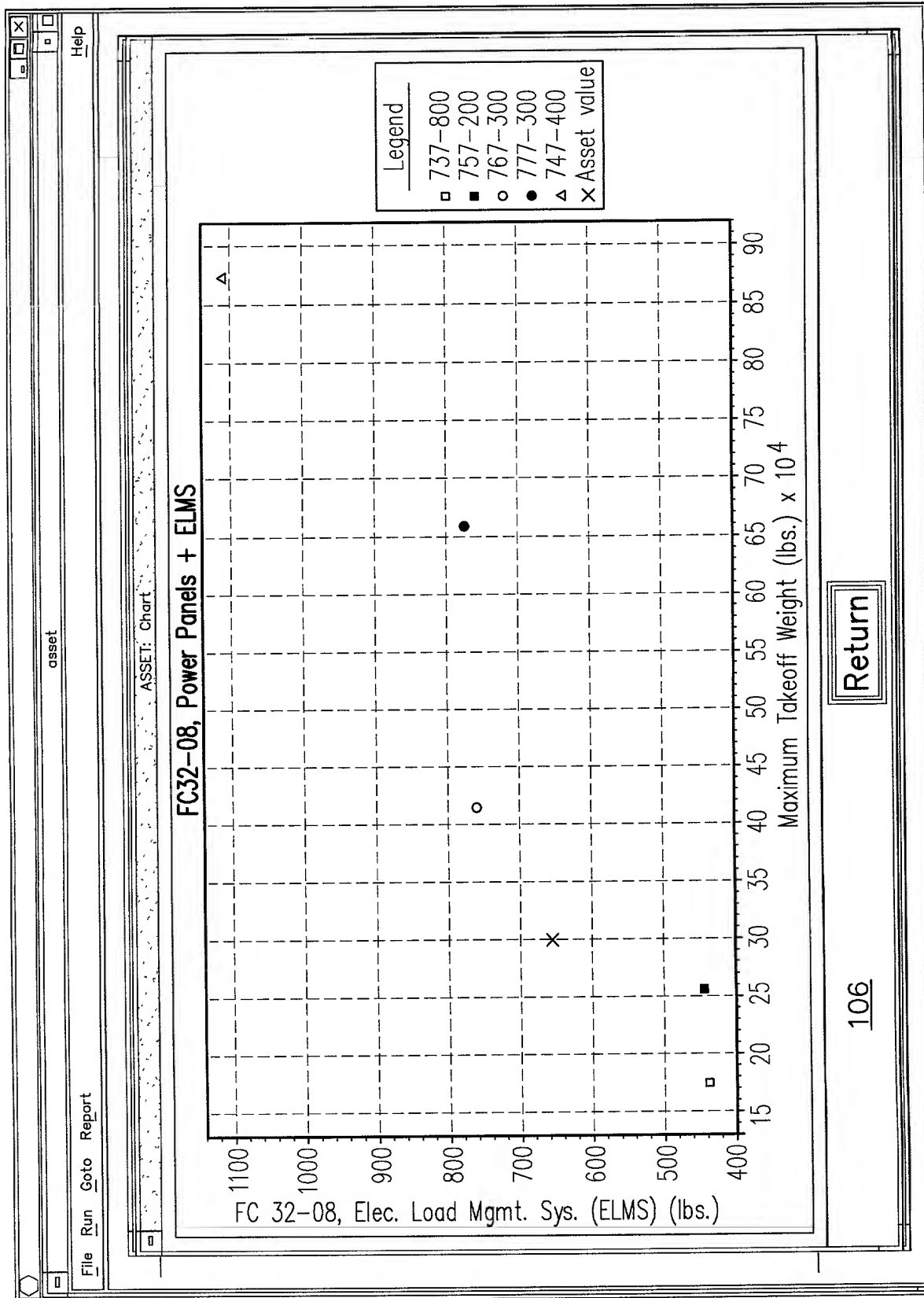


FIG. 79

86/87

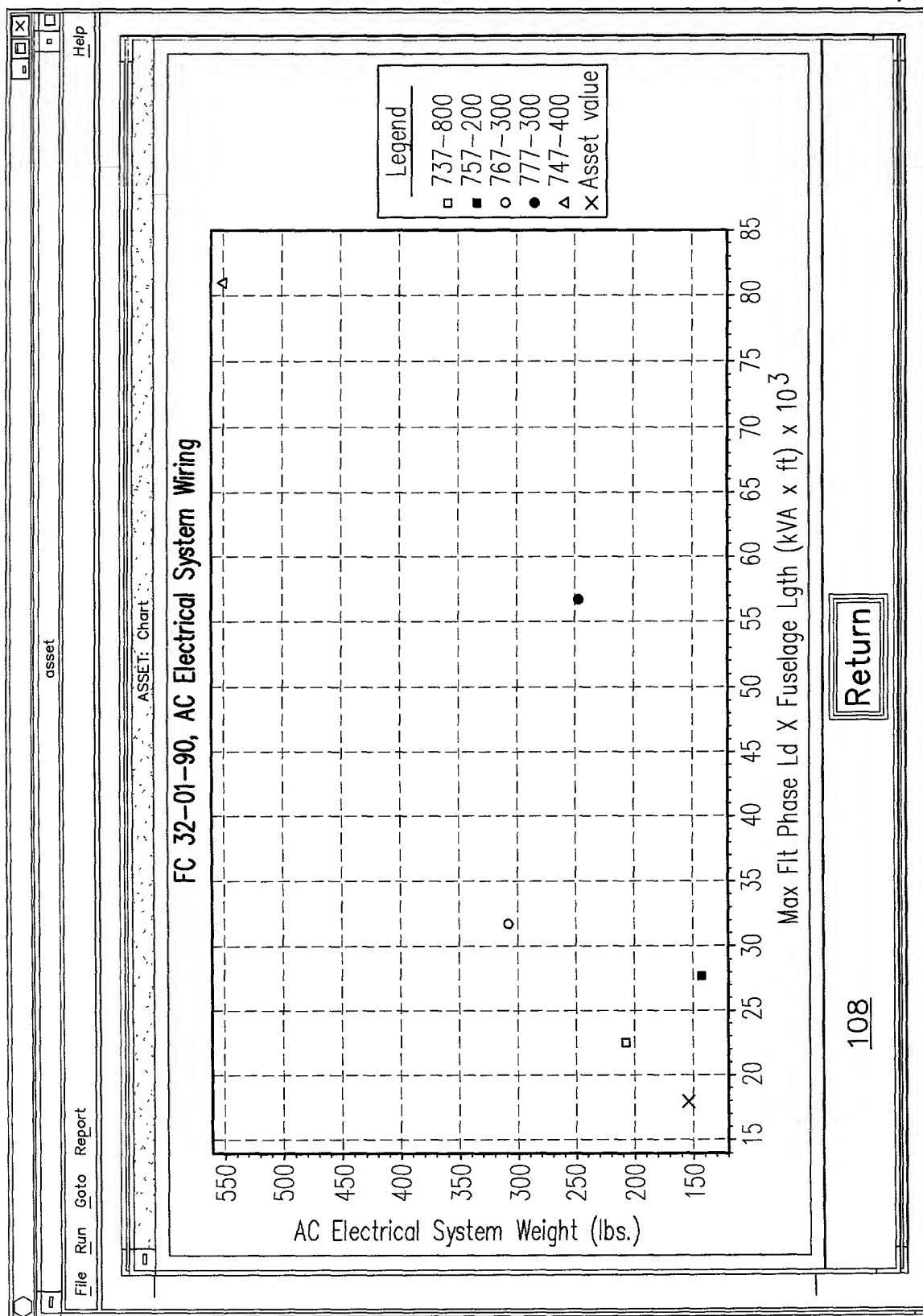


FIG. 80

INVENTOR: BOND, et al.

SN: 09/900,522; FILED 7/6/01

ATTY: MARK D. ELCHUK; PHONE: (248) 641-1229

87/87

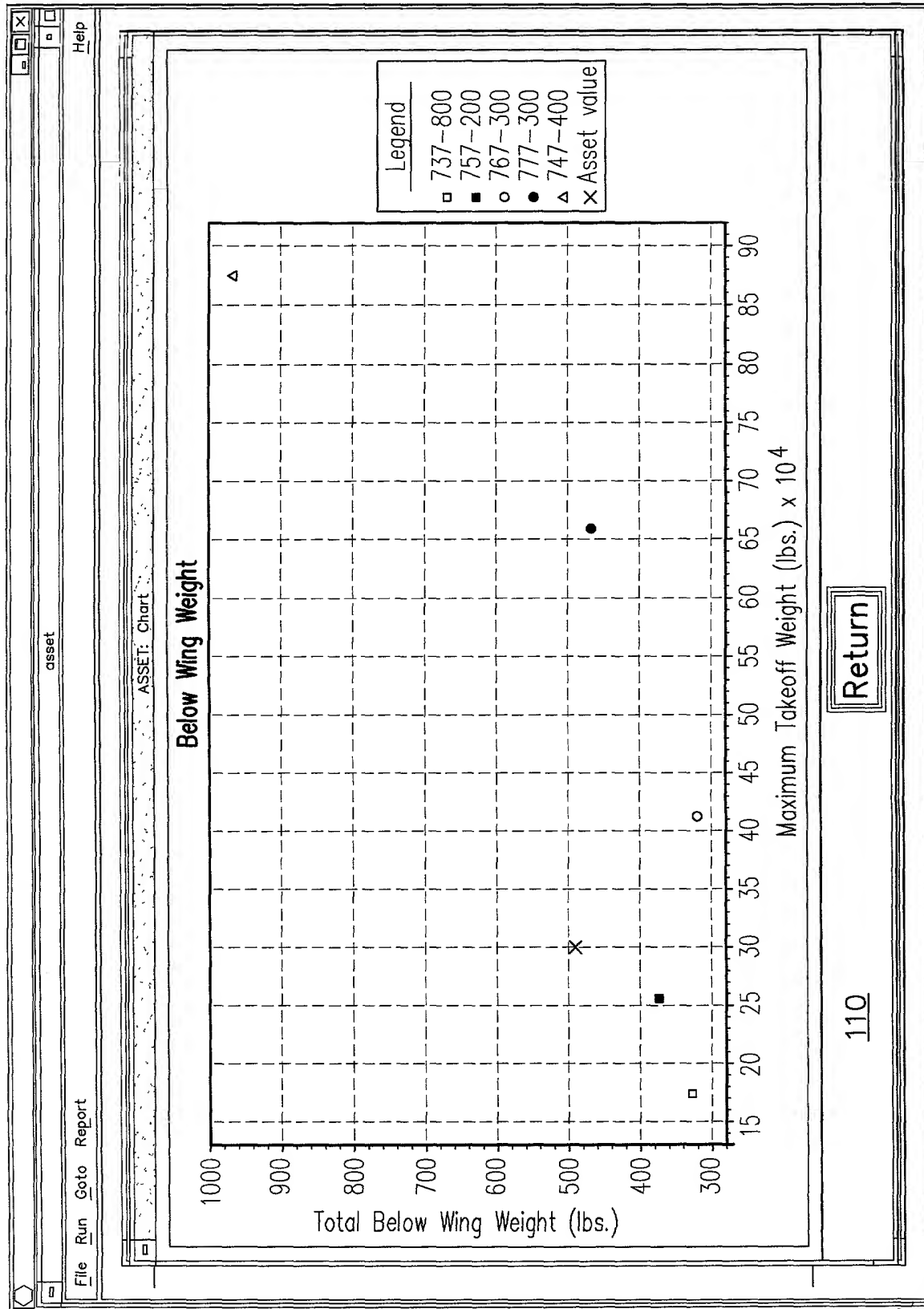


FIG. 81